New taxa and a new infrageneric classification in *Dryandra* R. Br. (Proteaceae: Grevilleoideae)

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Abstract

A.S. George. New taxa and a new infrageneric classification in *Dryandra* R. Br. (Proteaceae: Grevilleoideae). Nuytsia 10 (3): 313-408 (1996). In preparation for an account in Volume 17 of the "Flora of Australia", new taxa (10 series, 29 species, 24 subspecies, 10 varieties) and a new infrageneric classification are presented. Twelve new combinations are made. A number of previously-published names are lecto- or neotypified. The work is based on classical taxonomic methods. The genus now consists of three subgenera, 24 series, 92 species and 36 infrageneric taxa. Keys to all taxa are given. The conservation status is given for each taxon treated; some are very restricted and two almost extinct in the wild.

Introduction

The genus *Dryandra*, described in 1810 by Robert Brown, is endemic in Western Australia. Most of the taxa previously named were published last century by Brown (1810, 1830) and Meisner (1856), and a generic treatment was published by Bentham (1870). Various taxa have been described since, particularly by Gardner (1927, 1964). For many years a revision has been sorely needed, but one by the current author, begun more than 20 years ago, is only now reaching completion for the "Flora of Australia". As part of the preparation for that work, a new infrageneric classification, concise descriptions of all new taxa and, where necessary, typifications of published names are presented here. The paper also gives keys to all taxa and a complete list of taxa in possible systematic sequence.

Methods

This work is based on a morphological study of herbarium material combined with field work. Almost all taxa have been seen in the field. Representatives of most types have been studied. Measurements are taken from herbarium material, but because of the sclerophyllous nature of dryandras there is virtually no change in dimensions from the fresh state. The width of the leaf lamina is taken at the greatest width including the lobes or teeth. Since the genus is endemic in south-western Western Australia, the State has been omitted from the notes on distribution of each taxon described.

Previous infrageneric classifications were published by Brown (1830), Meisner (1856) and Bentham (1870). Meisner proposed a classification with two ranks, one of section based on the fruit and seed, the other of informal rank designated by the symbol § based mainly on foliage. Bentham also had two ranks, section based on seed and to a less extent the involucre, and series based primarily on flowers, inflorescence and leaves. Virtually all these infrageneric taxa are now considered heterogeneous, hence considerable rationalization is needed. As far as possible, existing infrageneric names have been retained and, where necessary, lectotypified. Two infrageneric ranks are used - subgenus and series. Although within subg. *Dryandra* the number of series with one or few species is remarkable, it reflects the morphology of the subgenus, for many species are very distinctive, yet an overall unity remains.

The concepts adopted for the ranks of species, subspecies and variety are the same as those used in *Verticordia* (George 1991), i.e. species where morphological characters and states are considered significant in the overall context of the genus, subspecies where the difference(s) are less significant and there is a geographical and/or ecological discontinuity, and variety where the difference(s) likewise are less significant than at specific rank but there is no geographical or ecological separation.

The suggested systematic sequence, required for the "Flora of Australia" treatment, is based very much on a subjective assessment of morphology in the genus. Relationships are quite evident within particular groups of species, mostly represented here by the series. There are, however, many distinctive species, e.g. *D. subulata*, *D. fraseri* and *D. idiogenes*, whose relationships are unclear, hence the large number of monotypic series. *Dryandra* is wide open for more detailed research, not only into its systematics but also into its biology, for little is known about pollinators and other fauna associated with it.

Key to infrageneric taxa

1 Separator absent; seed wing annular, and with a large supplementary wing each side and attached at the base ..... subg. 3 **Diplophragma**

1: Separator present between seeds (often only 1 seed fertile); seed wing terminal or absent

2 Seed not winged

3 Follicle ± cartilaginous ..... subg. 2 **Hemiclidia**

3: Follicle woody ..... ser. 15 **Ionthocarpae**

2: Follicle woody ..... subg. 1 **Dryandra**

4 Pistil longer than perianth

5 Perianth straight or the limb inflexed centripetally before anthesis; pistil similarly straight or bowed centripetally, rarely centrifugally

6 Pollen presenter markedly swollen; perianth lobes flared widely at apex of basal tube; flowers fewer than 20 per head ..... ser. 22 **Pectinatae**

6: Pollen presenter not or scarcely enlarged; perianth not flared but in some species succulent near base; flowers 30-220 per head

7 Perianth swollen and succulent above base (appears thick but irregularly shrivelled in dried specimens) ..... ser. 12 **Runcinatae**

7: Perianth not swollen or succulent

8 At least some leaves bipinnatifid; hairs of perianth claws sticky ..... ser. 23 **Acuminatae**

8: No leaves bipinnatifid; hairs of perianth claws not sticky

9 Receptacle markedly convex; flowers at anthesis arising around a central hole ..... ser. 24 **Niveae**

9: Receptacle flat or gently convex or concave; flowers at anthesis ± evenly spaced in head

10 Leaves pinnatisect with large triangular lobes ..... ser. 13 **Triangulares**

10: Leaves otherwise

11 Follicle 5-6 mm long; seed wing small ..... ser. 6 **Capitellatae**

11: Follicle 6-24 mm long; seed wing prominent

12 Floral bracts apparently absent; pistil straight; leaves sessile or petiole less than 5 mm long, the margins flat or very slightly recurved ..... ser. 1 **Floribundae**

12: Floral bracts present; pistil usually curved; leaves with petiole usually more than 5 mm long and margins recurved to revolute

13 Longest involucral bracts as long as flowers

14 Leaves very large, pinnatipartite (lamina usually 20-45 cm long and 5-14 cm wide with linear lobes); pistil 58-74 mm long ..... ser. 14 **Aphragma**

14: Leaves cuneate, dentate or serrate, or narrowly linear with widely spaced short recurved teeth; pistil 27-52 mm long

15 Leaves cuneate, less than 12 cm long; involucral bracts tomentose and plumose; pistil 30-52 mm long ..... ser. 7 **Ilicinae**

15: Leaves linear, up to 35 cm long; involucral bracts sparsely pubescent to glabrous except ciliate margins; pistil 27-28 mm long ..... ser. 10 **Decurrentes**

13: Longest involucral bracts shorter than flowers

16 Leaves white-tomentose all over below ..... ser. 7 **Ilicinae**

16: Leaves not tomentose below except in pits

17 Follicle 15-21 mm long

18 Leaves pinnatifid with 25-110 small triangular lobes each side; receptacle flat; follicles curved-obovate ..... ser. 9 **Foliosae**

18: Leaves pinnatisect with fewer than 20 linear lobes each side; receptacle very convex; follicles cuneate ..... ser. 4 **Folliculosae**

17: Follicle less than 14.5 mm long

19 Follicle ovate, longer than wide; seed wing markedly decurrent on one side only

20 Pistil exserted but not prominently looped before anthesis; pollen presenter narrow

21 Leaves relatively soft; involucral bracts broad, obtuse, closely tomentose outside; pistil usually more than 35 mm long, stout ..... ser. 8 **Dryandra**

21: Leaves sclerophyllous; involucral bracts usually narrow, acute to acuminate, glabrous to pubescent or hirsute outside; pistil usually less than 35 mm long, slender ..... ser. 2 **Armatae**

20: Pistil looped out prominently before anthesis; pollen presenter ovoid ..... ser. 3 **Marginatae**

19: Follicle transversely elliptic to obovate; seed wing decurrent almost to base on each side ..... ser. 5 **Acrodontae**

5: All perianths and pistils in head markedly curved downwards or upwards

22 Involucral bracts prominently hirsute with the longest hairs up to 3-5 mm long ..... ser. 19 **Plumosae**

22: Involucral bracts tomentose, velvety or shortly hirsute, the longest hairs less than 2 mm long

23 Leaf lamina (excluding teeth or lobes) elliptic, oblong or broadly linear; follicles oblique, ovate, elliptic or oblong; pollen presenter 0.3-0.8 mm long ..... ser. 20 **Concinnae**

23: Leaf lamina (excluding teeth or lobes) narrowly linear; follicles erect, ovate, obovate, cuneate or transversely elliptic; pollen presenter 1-1.5 mm long ..... ser. 21 **Obvallatae**

4: Pistil shorter than or as long as perianth

24 Follicle with a prominent terminal tuft of long rusty hairs ..... ser. 15 **Ionthocarpae**

24: Follicle hairy all over or ± glabrous

25 Inflorescence subtended by reduced rigid, entire, pungent, scabrous leaves ..... ser. 17 **Subulatae**

25: Leaves subtending inflorescence lobed, or if entire then not rigid or scabrous

26 Involucre of broad brown bracts, usually shining

27 Involucral bracts cartilaginous, pubescent, hirsute or almost glabrous; flowers gold, orange or pinkish; seed wing entire

28 At least some leaves 20 mm or more wide, with large triangular to linear lobes; involucral bracts villous, hirsute or pubescent all over ..... ser. 14 **Aphragma**

28: Leaves less than 6 mm wide, shortly pinnatifid, serrate or entire; involucral bracts appressed-pubescent to glabrous except shortly pubescent margins ..... ser. 11 **Tenuifoliae**

27: Involucral bracts papery, cobwebby; flowers red and white; seed wing notched ..... ser. 16 **Inusitatae**

26: Involucre of narrow, hairy bracts, usually dull ..... ser. 18 **Gymnocephalae**

Key to species

1 Pistil longer than perianth, the style bowed and exserted laterally between 2 tepals before anthesis

2 Involucral bracts shorter than perianth/pistil

3 Pistil crook-shaped, 68-79 mm long; pollen presenter prominent, ovoid; tepals flared widely at apex of basal tube; flowers 12-17 per head (Badgingarra district) ..... **D. nana**

3: Pistil straight to gently curved, usually less than 60 mm long; pollen presenter narrow; flowers 20-250 per head

4 Receptacle prominently convex; flowers arising in a circle around a central hole at anthesis

5 Leaves pinnatipartite, usually with at least some lobes also pinnatipartite; involucral bracts subulate; perianth loosely hirsute with sticky hairs (between Woodanilling, Cranbrook & Collie) ..... **D. preissii**

5: Leaves simply pinnatipartite; involucral bracts obtuse to shortly acute; perianth villous to pubescent with non-sticky hairs

6 Leaf lobes essentially subulate, linear or oblong

7 Leaf lobes subulate

8 Leaf lobes not twisted, held vertically (Kojonup to Ongerup, Stirling Range & Albany) ..... **D. arctotidis**

8: Leaf lobes twisted so that upper half of lamina is ± horizontal (Eneabba to Cataby) ..... **D. tortifolia**

7: Leaf lobes oblong or linear

9 Plant with underground stems; fire-tolerant; leaf lobes 15-35 each side (Geraldton to Cape Naturaliste & E to Corrigin & Traysurin) ..... **D. lindleyana**

9: Plant with stems above ground, fire-sensitive; leaf lobes 40-70 each side (Albany to Stirling Range & E to Cape le Grand) ..... **D. brownii**

6: Leaf lobes essentially triangular

10 Plant with underground stems, fire-tolerant

11 Leaf lobes 1-3 mm wide at base, the lower (basal) margin more revolute than the upper, slightly overlapping (near Badgingarra) ..... **D. stenoprion**

11: Leaf lobes 2-8 mm wide at base, both margins slightly and ± equally revolute, not overlapping; widespread

12 Leaves 10-15 mm wide; lobes with tips usually recurved (W of Arrino to Alexander Morrison National Park) ..... **D. cypholoba**

12: Leaves 5-8 mm wide; lobes ± flat (Geraldton to Cape Naturaliste & E to Corrigin & Traysurin) ..... **D. lindleyana**

10: Plant with above-ground stems, fire-sensitive (Lake Indoon to Nyabing & E to Cape Arid, on the Scott River plain & E of Busselton) ..... **D. nivea**

4: Receptacle gently concave, or flat, or gently convex; flowers arising ± equally-spaced from the receptacle at anthesis

13 At least some leaves more than 20 cm long; mostly low shrubs with short stems

14 Leaves entire or almost so in upper two thirds, the lowest third pinnatipartite with subulate lobes (Pingelly to Tambellup) ..... **D. subpinnatifida**

14: Leaves prominently pinnatipartite throughout

15 Leaves 4-18 mm wide

16 Leaf lobes 6-21 each side (Esperance to Mt Ragged) ..... **D. longifolia**

16: Leaf lobes 25-110 each side

17 Pistil 42-56 mm long (Eneabba to Katanning) ..... **D. nobilis**

17: Pistil 18-40 mm long

18 Perianth 17-19 mm long; pistil 18-21 mm long (Stirling Range) ..... **D. montana**

18: Perianth 25-30 mm long; pistil 28-40 mm long

19 Leaves with 25-45 lobes each side (near Busselton, Stirling Range to Albany) ..... **D. baxteri**

19: Leaves with 60-110 lobes each side (Tarin Rock, Ravensthorpe) ..... **D. foliosissima**

15: Most leaves more than 20 mm wide

20 Leaf lobes linear; pistil 58-74 mm long; perianth limb 9-10 mm long (Cadoux to Hyden) ..... **D. shanklandiorum**

20: Leaf lobes triangular, usually broadly so

21 Pistil pilose in lower half; follicles 5-6 mm long, with prominent terminal tuft of hairs (Kamballup) ..... **D. ionthocarpa**

21: Pistil glabrous; follicles 13-19 mm long, sparsely hairy, glabrescent

22 Leaves less than 25 mm wide (Eneabba to Katanning) ..... **D. nobilis**

22: Leaves 25-70 mm wide

23 Leaf lobes prominently curved in to apex (Mogumber to Bremer Bay) ..... **D. drummondii**

23: Leaf lobes with ± straight edges

24 Stems with ± straight lanceolate villous prophylls; perianth 35–43 mm long, the limb 8-11 mm long; flowers 50-85 per head (Nyabing to Hyden) ..... **D. octotriginta**

24: Stems with recurved, ovate-oblong tomentose prophylls; perianth 44-56 mm long, the limb 12-14 mm long; flowers *c.* 110 per head (near Badgingarra) ..... **D. catoglypta**

13: Leaves usually less than 20 cm long, in several species some longer

25 Leaves with at least some lobes again pinnatipartite; perianth claws loosely hirsute with sticky hairs (Woodanilling to Cranbrook & Collie) ..... **D. preissii**

25: Leaves simply pinnatipartite or pinnatisect; perianth hairs not sticky

26 Pistil *c.* 15 mm longer than perianth; leaves 3–4 mm wide (Wongan Hills) ..... **D. pulchella**

26: Pistil usually no more than 10 mm longer than perianth, if longer than 15 mm then leaves at least 6 mm wide

27 Leaf lamina excluding lobes cuneate to obovate

28 Leaves white-tomentose below

29 Leaves sessile or almost so, 22-50 mm wide; longest involucral bracts to 12-15 mm long; floral bracts 2 mm long (Clackline to Dwellingup) ..... **D. praemorsa**

29: Leaves petiolate, 12-22 mm wide; longest involucral bracts to 20-25 mm long; floral bracts 15-17 mm long (Stirling Range) ..... **D. anatona**

28: Leaves glabrous below except pits

30 Floral bracts absent; leaf margins flat (Kalbarri to Albany) ..... **D. sessilis**

30: Floral bracts present; leaf margins recurved to revolute

31 Follicles 6-7 mm long, not indurated; perianth limb glabrous or sparsely hairy

32 Leaves bright green; flowers ± bright yellow (Stirling Range to Israelite Bay) ..... **D. falcata**

32: Leaves glaucous; flowers pale yellow (Eneabba to Mogumber) ..... **D. glauca**

31: Follicles 10-14 mm long, indurated; perianth limb hairy

33 Involucral bracts pale; pistil 24-40 mm long; pollen presenter 1-1.3 mm long, pale; flowers 35-100 per head (Narrogin to Albany & Israelite Bay) ..... **D. cuneata**

33: Involucral bracts dark brown; pistil 22-26 mm long; pollen presenter 1 mm long, dark brown; flowers 180-190 per head (Gillingarra) ..... **D. fuscobractea**

27: Leaf lamina excluding lobes linear, oblong, elliptic or narrowly obovate

34 Leaf lamina narrowly obovate with no or 1-3 teeth each side

35 Heads terminal, conspicuous; pistil 16-23 mm long; perianth creamy-white, often pink-tinged; shrub without lignotuber (Geraldton to Gingin) ..... **D. carlinoides**

35: Heads on short branchlet near base of stem, inconspicuous; pistil 30-40 mm long; perianth yellow; many-stemmed shrub with lignotuber (Arrowsmith to Hill River) ..... **D. tridentata**

34: Leaf lamina linear, oblong or elliptic, usually with several to many lobes each side

36 Pistils within head straight or bowed towards centre

37 Perianth 43-60 mm long

38 Stems with ± straight lanceolate villous prophylls; perianth limb 8-11 mm long; flowers 50-85 per head; (Nyabing to Hyden) ..... **D. octotriginta**

38: Stems with recurved, ovate-oblong tomentose prophylls; perianth limb 12-14 mm long; flowers 110 per head (near Badgingarra) ..... **D. catoglypta**

37: Perianth 38 mm or less long

39 Leaves pinnatisect (Kalbarri to Cranbrook) ..... **D. fraseri**

39: Leaves pinnatipartite or serrate

40 Leaf lobes linear

41 Perianth 29-34 mm long; pistil 32-43 mm long; shrub without lignotuber; leaves 25-35 mm wide, sinuses between lobes 5-15 mm across (Gnowangerup to Munglinup) ..... **D. cirsioides**

41: Perianth 20-27 mm long; pistil 22-33 mm long; shrub with lignotuber

42 Flowers *c.* 80-100 per head; shrub usually suckering; leaves 40-45 mm wide; sinuses 10-25 mm across (Newdegate to Hyden & Frank Hann National Park) ..... **D. xylothemelia**

42: Flowers *c.* 35 per head; leaves 10-25 mm wide; sinuses 3-7 mm across (Kulin to Nyabing) ..... **D. meganotia**

40: Leaf lobes or teeth triangular

43 Flowers golden orange, sometimes pink-tinged; heads 5-7 cm diam.

44 Leaves soft; floral bracts glabrous (Busselton to Two Peoples Bay & Stirling Range) ..... **D. formosa**

44: Leaves rather leathery; floral bracts hirsute or villous

45 Leaves divided more than half way to midrib, usually dark green above; at least some leaves 15-20 cm long; follicles 16-19 mm long (Eneabba to Katanning) ..... **D. nobilis**

45: Leaves divided less than half way to midrib, usually bluish green above; leaves never more than 15 cm long; follicles 9-11 mm long (York to Broomehill) ..... **D. stuposa**

43: Flowers pale to medium yellow; heads less than 4 cm diam.

46 Leaves 3-9 mm wide

47 Pistil loosely hirsute

48 Pollen presenter 2.5-4 mm long; involucral bracts mainly glabrous outside except margins, shining brown (Badgingarra, Mogumber) ..... **D. serratuloides**

48: Pollen presenter 0.9-1.3 mm long; involucral bracts hirsute and tomentose

49 Pollen presenter 0.9-1.2 mm long, noticeably thicker than apex of style; perianth 12-20 mm long; pistil markedly looped before anthesis (Eneabba to Armadale) ..... **D. kippistiana**

49: Pollen presenter 1-1.3 mm long, scarcely thicker than apex of style; perianth 19-22 mm long; pistil gently bowed before anthesis (Eneabba to Badgingarra) ..... **D. sclerophylla**

47: Pistil glabrous except a few hairs on ovary

50 Pistil 16-19 mm long (New Norcia to Bindoon) ..... **D. polycephala**

50: Pistil 22-31 mm long

51 Pistil 27-31 mm long; perianth limb hirsute (Three Springs to Badgingarra) ..... **D. stricta**

51: Pistil 22-26 mm long; perianth limb glabrous or with a few hairs near base (New Norcia to Regans Ford & Gingin) ..... **D. echinata**

46: Leaves 10-35 mm wide

52 At least some leaves 15 cm or more long

53 Flowers 150-250 per head; involucral bracts 14-30 mm long; perianth limb hairy at least in lower half (Esperance to Mt Ragged) ..... **D. longifolia**

53: Flowers 35-65 per head; involucral bracts *c.* 10 mm long; perianth limb glabrous

54 Pistil 32-33 mm long (Wongan Hills) ..... **D. wonganensis**

54: Pistil 23-27 mm long

55 Perianth limb *c.* 2.5 mm long; involucral bracts pubescent with densely ciliate margins; pollen presenter 1-1.5 mm long (Moora to New Norcia & Cataby) ..... **D. hewardiana**

55: Perianth limb 3-4 mm long; involucral bracts glabrous or with shortly ciliate margins; pollen presenter 1.8-2 mm long (Three Springs)..... **D. trifontinalis**

52: Leaves less than 13 cm long (juvenile leaves may be longer)

56 Leaves with subulate teeth on petiole and base (Woodanilling to Katanning) ..... **D. acanthopoda**

56: Leaves without teeth on petiole and base

57 Pistil 40-48 mm long

58 Involucral bracts mainly glabrous; stems closely pubescent (Kalbarri to Three Springs) ..... **D. borealis**

58: Involucral bracts hirsute; stems hirsute and tomentose (Stirling Range)..... **D. hirsuta**

57: Pistil 20-39 mm long

59 Pistil glabrous (Kulin to Nyabing & Frank Hann National Park) ..... **D. pallida**

59: Pistil hirsute in lower third to half

60 Pollen presenter 0.8-1.5 mm long

61 Pistil 20-26 mm long; involucral bracts usually recurved; leaf lobes up to 10 each side (Bindoon to Albany; Whicher Range) ..... **D. squarrosa**

61: Pistil 28-32 mm long; involucral bracts all erect; leaf lobes 1-6 each side (N of Southern Cross)..... **D. arborea**

60: Pollen presenter 3-4.5 mm long

62 Perianth 25-32 mm long; limb 4-4.5 mm long; floral bracts glabrous (Mt Lesueur to Albany & E to Israelite Bay) ..... **D. armata**

62: Perianth 22-24 mm long; limb 4.5-6.5 mm long; floral bracts hirsute at base (Tathra National Park to Bendering) ..... **D. purdieana**

36: Pistils within head curved downwards or downwards and with the apex upturned

63 Pistils curved downwards then up

64 Leaf lamina except lobes elliptic; involucral bracts silky-villous; floral bracts hirsute both sides (Stirling Range, Albany) ..... **D. concinna**

64: Leaf lamina except lobes linear; involucral bracts appressed-pubescent; floral bracts hirsute one side, glabrous the other (Bow River to Mt Manypeak) ..... **D. serra**

63: Pistil curved ± evenly downwards

65 Leaves except lobes oblong; lobes obliquely ovate; involucral bracts ovate to lanceolate (Stirling Range) ..... **D. foliolata**

65: Leaves except lobes narrowly linear; lobes linear to narrowly triangular; involucral bracts linear to subulate

66 Leaf lobes strongly twisted (Stirling Range) ..... **D. montana**

66: Leaf lobes not twisted

67 Floral bracts 5-6 mm long; pollen presenter 1.5-1.8 mm long; follicles obliquely obovate or elliptic (Miling to South Stirling) ..... **D. conferta**

67: Floral bracts 3.5-4 mm long; pollen presenter 1 mm long

68 Leaf lobes 10-25 each side; follicles transversely ovate (Eneabba to Mogumber) ..... **D. platycarpa**

68: Leaf lobes 2-5 each side; follicles narrowly ovate (Stirling Range) ..... **D. seneciifolia**

2: Involucral bracts as long as or exceeding perianth/pistil

69 Pistil straight or gently curved outwards or inwards

70 Involucral bracts broad, obtuse, dark red-brown, often shining

71 Involucral bracts 80-90 mm long (near Kulin) ..... **D. epimicta**

71: Involucral bracts 30-75 mm long

72 Perianth not swollen at apex of basal tube; limb usually 5-7 mm long, occasionally to 7.5 mm

73 Pollen presenter 5-5.5 mm long; pistil 35-38 mm long (Fitzgerald River to Israelite Bay) ..... **D. obtusa**

73 Pollen presenter 2.8-3.5 mm long; pistil 23-31 mm long

74 Leaves entire or pinnatifid with obtuse to acute lobes; petiole very slender, to 5 cm long; flowers *c.* 80-100 per head; floral bracts *c.* 4 mm long; prostrate or sprawling shrub to 3 m across or bushy and up to 1.5 m tall (Darkan to Esperance) ..... **D. tenuifolia**

74: Leaves distantly pinnatifid with recurved pungent lobes; petiole robust, to 2 cm long; flowers *c.* 150 per head; floral bracts 10-11 mm long; dense, erect shrub to 3 m tall (Wongan Hills) ..... **D. comosa**

72: Perianth swollen and succulent at apex of basal tube; limb 7-8.5 mm long

75 Leaves serrate; erect shrubs

76 Involucral bracts 40-50 mm long (Ravensthorpe) ..... **D. corvijuga**

76: Involucral bracts 50-75 mm long (Toodyay to Narrogin) ..... **D. proteoides**

75: Leaves pinnatifid, rarely almost entire; low or prostrate shrubs (Pingelly to Stirling Range & E to Forrestania) ..... **D. ferruginea**

70: Involucral bracts acuminate, usually plumose, pale to dark brown

77 Leaves broadly cuneate, serrate (Gairdner River to Ravensthorpe) ..... **D. quercifolia**

77: Leaves linear, pinnatifid

78 Perianth 15-20 mm long (Stirling Range area) ..... **D. mucronulata**

78: Perianth 25-30 mm long

79 Involucral bracts silky-villous; leaf teeth 60-110 each side of leaf (Busselton; Stirling Range to Albany) ..... **D. baxteri**

79: Involucral bracts tomentose; leaf teeth 25-45 each side of leaf (Tarin Rock, Ravensthorpe) ..... **D. foliosissima**

69: Pistil curved down

80 Involucral bracts softly plumose (Stirling Range to Bremer Bay) ..... **D. plumosa**

81 Longest involucral bracts to 30 mm long, filiform towards apex; flowers 45-80 per head; follicle 11-15 mm long (Stirling Range to West Mt Barren) ..... **D. plumosa**

81: Longest involucral bracts to 20 mm long, narrow but not filiform towards apex; flowers *c.* 90-100 per head; follicle 17-18 mm long (Stirling Range) ..... **D. pseudoplumosa**

80: Involucral bracts tomentose or hirsute

82 Leaves serrate to dentate; involucral bracts silky-villous (Corrigin to Kukerin) ..... **D. fasciculata**

82: Leaves pinnatifid; involucral bracts hirsute or pubescent

83 Leaf lobes 5-18 each side of leaf, triangular–falcate; involucral bracts with glandular hairs (Pingelly) ..... **D. columnaris**

83: Leaf lobes 2-5 each side of leaf; involucral bracts without glandular hairs

84 Pistil 23-31 mm long, yellow; involucral bracts 25-33 mm long (Corrigin to Kukerin) ..... **D. fasciculata**

84: Pistil 18-22 mm long, red; involucral bracts to 20 mm long (Woodanilling to Nyabing & Tarin Rock) ..... **D. rufistylis**

1: Pistil *c.* as long as or slightly shorter than perianth, the style not laterally exserted before anthesis

85 Leaves bipinnatifid (Eneabba to Manjimup) ..... **D. bipinnatifida**

85: Leaves serrate, pinnatifid or pinnatipartite, sometimes entire

86 Leaves entire; heads nodding or horizontal

87 Leaves subtending inflorescence not or little reduced, pliable; involucral bracts 40-50 mm long, plumose; leaves 5-10 cm long; perianth 24-30 mm long; erect, bushy shrub with flowers on upper branches (Tathra National Park to Badgingarra; Tammin) ..... **D. speciosa**

87: Leaves subtending inflorescence reduced, rigid, pungent; involucral bracts 10-12 mm long, loosely hirsute; leaves 15-35 cm long; perianth 22-24 mm long; low shrub with flowers almost at ground level (Eneabba to Badgingarra) ..... **D. subulata**

86: Leaves dentate, serrate or pinnatifid

88 Leaves more than 15 mm wide

89 Involucral bracts papery with cobwebby indumentum; flowers red and white (Newdegate) ..... **D. idiogenes**

89: Involucral bracts firm, tomentose; flowers yellow or golden orange

90 Pistil 34-45 mm long

91 Longest involucral bracts 9-15 mm long

92 Leaf lobes triangular; stems with scattered prophylls (Tenterden to Albany and Wellstead) ..... **D. calophylla**

92: Leaf lobes linear; stems covered with prophylls (Woodanilling) ..... **D. lepidorhiza**

91: Longest involucral bracts 20-42 mm long

93 Bushy shrub with erect stems; perianth limb 13-15 mm long (Stirling Range to Lort River) ..... **D. nervosa**

93: Shrub with prostrate, usually underground stems; perianth limb 8-13 mm long

94 Leaves 50-120 mm wide

95 Involucral bracts broadly ovate, obtuse, the innermost to 20 mm long; margins of leaf lobes strongly revolute, usually obscuring lower surface (Fitzgerald River to Israelite Bay; Badgingarra to Eneabba) ..... **D. pteridifolia**

95: Involucral bracts lanceolate, acute, the innermost to 35-40 mm long; margins of leaf lobes recurved, the lower surface exposed, 3-nerved (Stirling Range) ..... **D. blechnifolia**

94: Leaves 20-45 mm wide

96 Flowers 20-30 per head; perianth villous above base, orange-pink; pistil 37-40 mm long; leaf lobes 30-40 each side (Woodanilling to Ongerup & Mount Barker) ..... **D. porrecta**

96: Flowers *c.* 80 per head; perianth tomentose above base, golden; pistil 33-36 mm long; leaf lobes 18-28 each side (E of Mundaring Weir) ..... **D. aurantia**

90: Pistil 49-74 mm long (Dumbleyung to Lake Grace & Harrismith) ..... **D. fililoba**

88: Leaves less than 15 mm wide; branchlets often covered with prophylls

97 Leaves with 25-75 teeth each side

98 Involucral bracts to 60 mm long, viscid; flowers 60-70 per head; pistil 54-55 mm long (Ironcaps) ..... **D. viscida**

98: Involucral bracts 20-40 mm long, not viscid; flowers 20-45 per head; pistil 24-35 mm long

99 Shrub with above-ground stems to 70 cm tall; involucral bracts 30-40 mm long; flowers 30-45 per head; perianth brown (Geraldton to Gingin) ..... **D. shuttleworthiana**

99: Shrub with underground stems; involucral bracts to 22 mm long; flowers 20 per head; perianth yellow (Mogumber, Perth, Whicher Range) ..... **D. mimica**

97: Leaves with 2–12 teeth each side

100 Pistil 37-49 mm long; pollen presenter 6-7 mm long (Pingelly to Woodanilling) ..... **D. cynaroides**

100: Pistil 23-36 mm long; pollen presenter 3-4 mm long

101 Flowers 15-25 per head (Kulin to Nyabing & E to Forrestania) ... **D. erythrocephala**

101: Flowers 35-50 per head

102 Leaves narrowly linear with revolute margins; branchlets hirsute (Tammin to Corrigin & Narembeen) ..... **D. horrida**

102: Leaves broadly linear with recurved margins; branchlets tomentose (Eneabba to Lake Grace) ..... **D. vestita**

Infrageneric classification

The following list of infrageneric taxa, species and infraspecific taxa in a possible systematic sequence is highly speculative, being based on an intellectual and intuitive assessment of the taxa as absorbed from a morphological study and knowledge of taxa in the field. A great deal more research is needed to confirm this scheme or determine a more robust one.

Dryandra R. Br. subg. 1. **Dryandra**

ser. 1. **Floribundae** Benth. *D. sessilis* (Knight) Domin var. *sessilis*, *D. sessilis* var. *cordata* (Meisn.) A.S. George, *D. sessilis* var. *flabellifolia* A.S. George, *D. sessilis* var. *cygnorum* (Gand.) A.S. George

ser. 2. **Armatae** Benth. *D. cuneata* R. Br., *D. fuscobractea* A.S. George, *D. armata* R. Br. var. *armata*, *D. armata* var. *ignicida* A.S. George, *D. arborea* C.A. Gardner, *D. hirsuta* A.S. George, *D. pallida* A.S. George, *D. purdieana* Diels, *D. xylothemelia* A.S. George, *D. cirsioides* Meisn., *D. acanthopoda* A.S. George, *D. squarrosa* R. Br. subsp. *squarrosa*, *D. squarrosa* subsp. *argillacea* A.S. George, *D. hewardiana* Meisn., *D. wonganensis* A.S. George, *D. trifontinalis* A.S. George, *D.stricta* A.S. George, *D. echinata* A.S. George, *D. polycephala* Benth., *D. subpinnatifida* C.A. Gardner var. *subpinnatifida*, *D. subpinnatifida* var. *imberbis* A.S. George, *D. longifolia* R. Br. subsp. *longifolia*, *D. longifolia* subsp. *calcicola* A.S. George, *D. longifolia* subsp. *archeos* A.S. George, *D. borealis* A.S. George subsp. *borealis*, *D. borealis* subsp. *elatior* A.S. George

ser. 3. **Marginatae** (Meisn.) A.S. George *D. pulchella* Meisn.

ser. 4. **Folliculosae** A.S. George *D. fraseri* R. Br. var. *fraseri*, *D. fraseri* var. *ashbyi* (B.L. Burtt) A.S. George, *D. fraseri* var. *oxycedra* A.S. George

ser. 5. **Acrodontae** (Meisn.) A.S. George *D. sclerophylla* Meisn., *D. kippistiana* Meisn.var. *kippistiana*, *D. kippistiana* var. *paenepeccata* A.S. George, *D. carlinoides* Meisn., *D. tridentata* Meisn.

ser. 6. **Capitellatae** A.S. George *D. serratuloides* Meisn. subsp. *serratuloides*, *D. serratuloides* subsp. *perissa* A.S. George, *D. meganotia* A.S. George

ser. 7. **Ilicinae** (Meisn.) A.S. George *D. praemorsa* Meisn. var. *praemorsa*, *D. praemorsa* var. *splendens* A.S. George, *D. quercifolia* Meisn., *D. anatona* A.S. George

ser. 8. **Dryandra** *D. formosa* R. Br., *D. nobilis* Lindl. subsp. *nobilis*, *D. nobilis* subsp. *fragrans* A.S. George, *D. stuposa* Lindl.

ser. 9. **Foliosae** A.S. George *D. mucronulata* R. Br. subsp. *mucronulata*, *D. mucronulata* subsp. *retrorsa* A.S. George, *D. baxteri* R. Br., *D. foliosissima* C.A. Gardner

ser. 10. **Decurrentes** (Meisn.) A.S. George *D. comosa* Meisn.

ser. 11. **Tenuifoliae** A.S. George *D. tenuifolia* R. Br. var. *tenuifolia*, *D. tenuifolia* var. *reptans* A.S. George, *D. obtusa* R. Br.

ser. 12. **Runcinatae** (Meisn.) A.S. George *D. ferruginea* Kippist ex Meisn. subsp. *ferruginea*, *D. ferruginea* subsp. *tutanningensis* A.S. George, *D. ferruginea* subsp. *pumila* A.S. George, *D. ferruginea* subsp. *obliquiloba* A.S. George, *D. ferruginea* subsp. *chelomacarpa* A.S. George, *D. ferruginea* subsp. *flavescens* A.S. George, *D. corvijuga* A.S. George, *D. epimicta* A.S. George, *D. proteoides* Lindl.

ser. 13. **Triangulares** A.S. George *D. drummondii* Meisn. subsp. *drummondii*, *D. drummondii* subsp. *hiemalis* A.S. George, *D. drummondii* subsp. *macrorufa* A.S. George, *D. octotriginta* A.S. George, *D. catoglypta* A.S. George

ser. 14. **Aphragma** (R. Br.) A.S. George *D. pteridifolia* R. Br. subsp. *pteridifolia*, *D. pteridifolia* subsp. *vernalis* A.S. George, *D. fililoba* A.S. George, *D. shanklandiorum* Randall, *D. nervosa* R. Br., *D. blechnifolia* R. Br., *D. porrecta* A.S. George, *D. aurantia* A.S. George, *D. calophylla* R. Br., *D. lepidorhiza* A.S. George

ser. 15. **Ionthocarpae** A.S. George *D. ionthocarpa* A.S. George

ser. 16. **Inusitatae** A.S. George *D. idiogenes* A.S. George

ser. 17. **Subulatae** A.S. George *D. subulata* C.A. Gardner

ser. 18. **Gymnocephalae** Benth. *D. cynaroides* C.A. Gardner, *D. erythrocephala* C.A. Gardner var. *erythrocephala*, *D. erythrocephala* var. *inopinata* A.S. George, *D. horrida* Meisn., *D. vestita* Meisn., *D. viscida* A.S. George, *D. mimica* A.S. George, *D. speciosa* Meisn. subsp. *speciosa*, *D. speciosa* subsp. *macrocarpa* A.S. George, *D. shuttleworthiana* Meisn.

ser. 19. **Plumosae** A.S. George *D. plumosa* R. Br. subsp. *plumosa*, *D. plumosa* subsp. *denticulata* A.S. George, *D. pseudoplumosa* A.S. George, *D. montana* C.A. Gardner ex A.S. George

ser. 20. **Concinnae** Benth. *D. concinna* R. Br., *D. serra* R. Br., *D. foliolata* Meisn.

ser. 21. **Obvallatae** Benth, *D. fasciculata* A.S. George, *D. conferta* Benth. var. *conferta*, *D. conferta* var. *parva* A.S. George, *D. columnaris* A.S. George, *D. platycarpa* A.S. George, *D. seneciifolia* R. Br., *D. rufistylis* A.S. George

ser. 22. **Pectinatae** (Meisn.) A.S. George *D. nana* Meisn.

ser. 23. **Acuminatae** A.S. George *D. preissii* Meisn.

ser. 24. **Niveae** Benth. *D. arctotidis* R. Br., *D. tortifolia* Meisn., *D. stenoprion* Meisn., *D. cypholoba* A.S. George, *D. lindleyana* Meisn. subsp. *lindleyana* var. *lindleyana*, *D. lindleyana* subsp. *lindleyana* var. *mellicula* A.S. George, *D. lindleyana* subsp. *media* A.S. George, *D. lindleyana* subsp. *pollosta* A.S. George, *D. lindleyana* subsp. *sylvestris* A.S. George, *D. lindleyana* subsp. *agricola* A.S. George, *D. brownii* Meisn., *D. nivea* (Labill.) R. Br. subsp. *nivea*, *D. nivea* subsp. *uliginosa* A.S. George

Dryandra subg. 2. **Hemiclidia** (R. Br.) A.S. George *D. falcata* R. Br., *D. glauca* A.S. George

Dryandra subg. 3. **Diplophragma** (R. Br.) A.S. George *D. bipinnatifida* R. Br. subsp. *bipinnatifida*, *D. bipinnatifida* subsp. *multifida* A.S. George

DRYANDRA

Dryandra R. Br., Trans. Linn. Soc. London 10: 211 (1810), *nomen conservandum*, *non* Thunberg (1783) (Euphorbiaceae). *Type*: *D. formosa* R. Br. (*typus conservandus*)

Josephia R. Br. ex Knight, Cult. Prot. 110 (1809). *Type*: *J. sessilis* Knight, *lecto* (here chosen).

Hemiclidia R. Br., Suppl. Prodr. Fl. Nov. Holl. 40 (1830). *Type*: *H. baxteri* R. Br.

Typification. Knight described two species in *Josephia* but one of his names, *J. rachidifolia*, is an illegitimate name being a replacement for *Banksia nivea* Labill., the base name for *Dryandra nivea* (Labill.) R. Br. His other species is therefore selected as lectotype of *Josephia*.

Subg. 1 *Dryandra*

Dryandra R. Br. subg. *Dryandra*

Follicles woody. Separator present between seeds (often only 1 seed fertile). Seed black; wing terminal.

By far the largest subgenus, containing 24 series and 89 species.

Ser. 1 *Floribundae*

Dryandra ser. *Floribundae* Benth., Fl. Austral. 5: 564, 568 (1870). *Type*: *D. floribunda* R. Br. = *D. sessilis* (Knight) Domin

Erect *shrubs* or small *trees* without lignotuber. *Leaves* cuneate to flabelliform, serrate, sessile or almost so; margins flat or almost so. *Inflorescence* terminal, ± conspicuous; involucral bracts shorter than flowers; floral bracts apparently absent. *Perianth* straight, slender. *Pistil* straight, slightly shorter than perianth; pollen presenter cylindrical to ellipsoidal above neck, smooth. *Faded flowers* soon falling, as a tuft. *Follicles* ovoid, firmly attached, usually opening as soon as mature. *Seed wing* terminal.

A single, widespread, variable species. The apparent absence of floral bracts is unique in the genus.

Dryandra sessilis (Knight) Domin, Vestn. Kral. Ceske Spolecn. Nauk. Tr. Mat. Prir. 2: 19 (1923) - *Josephia sessilis* Knight, Cult. Prot. 110 (1809). *Type*: King George Sound, [Western Australia], October 1791, *A. Menzies* (*lecto* (here chosen): BM; *isolecto:* BM).

Typification. There are specimens on two sheets at BM. That chosen as lectotype is a flowering specimen on a sheet with the following collection details written on the reverse: 'New Holland, King Georges Sound, Mr. Arch. Menzies'. The other specimen on the sheet is in leaf only.

A variable species here divided into 4 varieties.

1 Stems pubescent; leaves usually no more than 3 cm long, less than 20 mm wide ..... var. **cygnorum**

1: Stems hirsute, soon glabrescent, rarely pubescent; at least some leaves more than 3 cm long

2 Leaves flabelliform, not auriculate ..... var. **flabellifolia**

2: Leaves cuneate to oblong, often auriculate

3 Pistil 23-29 mm long; leaves usually 2-3 cm long and up to 25 mm wide, occasionally to 5 cm long ..... var. **sessilis**

3: Pistil 30-34 mm long; leaves up to 6 cm long and 40 mm wide ..... var. **cordata**

Dryandra sessilis (Knight) Domin var. **sessilis**

D. floribunda R.Br., Trans. Linn. Soc. London 10: 212 (1810). *Type*: King George Sound, [Western Australia], December 1801, *R.Brown* Iter Australiense 3418 (*holo*: BM; *iso*: K).

Distribution. Widespread from Regans Ford and Moora to Collie and south-east to Bremer Bay, extending inland to near Wongan Hills, Pingelly and Kulin, and in the Stirling Range.

Habitat. Common in the drier Jarrah forest. Grows in lateritic soil and in sand, in open forest, woodland and tall shrubland, often locally dominant.

Flowering period. Late May-November.

Discussion. The most widespread variety. Plants near the south coast tend to be of more spreading habit and have more robust foliage. Those from the most inland localities have smaller leaves.

Dryandra sessilis var. **flabellifolia** A.S. George, var. nov.

Frutex ad 5 m altus. Caules glabri, raro parce pubescentes. Folia flabelliformia, plerumque 2-4 cm longa, 17-35 mm lata, ad basin arcte angustata, petiolo plerumque ad 5 mm longo. Flores *c.* 90 per capitulum. Perianthium 26-28 mm longum. Pistillum 28-29 mm longum; praebitor pollinis 1-1.2 mm longus. Folliculi 10-11 mm longi.

Typus: West Binnu Rd, 4.4 km E of junction with Yeringa South Rd, NNW of Northampton, Western Australia, 11 August 1993, *A.S. George* 17026 (*holo*: PERTH 04228650; *iso*: CANB).

Shrub to 5 m. *Stems* glabrous, rarely sparsely pubescent. *Leaves* flabelliform, mostly 2-4 cm long, 17-35 mm wide, markedly narrowed to base, usually on petiole to 5 mm long. *Flowers c.* 90 per head. *Perianth* 26-28 mm long. *Pistil* 28–29 mm long; pollen presenter 1-1.2 mm long. *Follicles* 10-11 mm long.

Selected collections examined. Hydraulic Rd, 8 km E of Bunney Rd, *A. Carr* 37 (PERTH); Marchagee Track, 1 km E of Dewar Rd, *E.A. Griffin* 3470 (PERTH); 32 km N of Geraldton, *R.A. Saffrey* 1540 (PERTH).

Distribution. Occurs between Geraldton and Kalbarri and inland to Northampton, and with scattered records south almost to Moora.

Habitat. Grows in deep sand and in lateritic soil, in tall shrubland.

Flowering period. June-October.

Conservation status. Not endangered.

Etymology. From the Latin *flabellum* (a fan) and *folium* (a leaf), in reference to the leaf shape.

Discussion. Similar to var. *sessilis* but the leaves are not auriculate. They are usually somewhat glaucous.

Dryandra sessilis var. **cordata** (Meisn.) A.S. George, comb. nov.

D. floribunda var. *cordata* Meisn., in J.G.C. Lehmann (ed.), *Pl. Preiss.* 2: 265 (1848). *Type*: south-western Western Australia, 184-, *J. Drummond* 2: 344 (*holo*: NY; *iso*: BM, K, MEL).

D. floribunda var. *major* Benth., Fl. Austral. 5: 569 (1870). *Type*: Cape Naturaliste, Western Australia, *A. Oldfield* (*holo*: K; *iso:* MEL).

Conservation status. Not endangered.

Discussion. This taxon has larger leaves and flowers than the other varieties.

Dryandra sessilis var. **cygnorum** (Gand.) A.S. George, stat. et comb. nov.

D. cygnorum Gand., Bull. Soc. Bot. France 66: 230 (1919). *Type*: Melville (Park) [suburb of Perth, Western Australia], 31 July 1897, *A. Morrison* (*holo*: LY, photo seen).

D. quinquedentata Gand., Bull. Soc. Bot. France 66: 230 (1919). *Type*: Swan River, Western Australia, 1902, *A. Lea* (*holo*: LY, photo seen).

Conservation status. Not endangered.

Discussion. Gandoger's names are synonymous, the characters used to distinguish them (width of leaves, number of leaf teeth, length of flower head) being somewhat variable over the geographic range of the taxon. It is readily distinguished from the other varieties by the usually smaller leaves and pubescent stems.

Ser. 2 *Armatae*

Dryandra ser. *Armatae* Benth., Fl. Austral. 5: 563, 566 (1870). *Type*: *D. armata* R. Br.

Mostly erect *shrubs* or small *trees*. *Leaves* sclerophyllous, linear to cuneate, serrate to pinnatifid; margins flat to recurved. *Inflorescence* terminal or on short branchlet, conspicuous; receptacle flat to gently convex; involucral bracts shorter than flowers, narrow, acute to acuminate, glabrous to pubescent or hirsute outside. *Perianth* straight, slender; limb inflexed before anthesis. *Pistil* straight or curved, longer than perianth; pollen presenter not or slightly thickened, smooth or finely ribbed. *Old flowers* usually persisting for some years. *Follicles* ovate to obovate, often notched on one side near base, usually opening as soon as mature, firmly or loosely attached. *Seed* with terminal notched wing.

A series of 20 species widespread throughout south-western Western Australia.

Dryandra cuneata R. Br., Trans. Linn. Soc. London 10: 212 (1810) - *Josephia cuneata* (R. Br.) Poir., Dict. Sci. Nat. 24: 246 (1822). *Type*: Lucky Bay, [Western Australia], January 1802, *R. Brown* Iter Australiense 3417 (*lecto* (here chosen): BM; *isolecto*: K, MEL).

Typification. Brown's specimens, some in flower, some not, include two variants. The non-flowering specimens are referred to as a second form in his manuscript notes at BM. The flowering specimens are those covered in his published description, and the sheet at BM bearing these is selected as lectotype.

Dryandra fuscobractea A.S. George, sp. nov.

Ab *D. cuneata* R. Br. bracteis involucralis fusco-brunneis, capitulis floribus pluribus (180-190) minoribus (perianthio 20-23 mm longo, pistillo 22-26 mm longo), limbo cinereo, et praebitore pollinis minore (1 mm longo) fusco, praecipue differt.

Typus: Boundary Rd, N of junction with Gillingarra W Rd, Western Australia, 25 July 1994, *M. Pieroni* 94/5 (*holo:* PERTH 04228685; *iso:* CANB, NSW).

Shrub to 1 m without lignotuber. *Stems* closely tomentose. *Leaves* cuneate, those about the involucre narrower, obtuse but prominently mucronate, pungently serrate; teeth 4-9 each side; lamina 4-7 cm long, 1-3 cm wide, glabrous above and below except pits; margins flat to slightly recurved; petiole 5-10 mm long. *Inflorescence* terminal or on short lateral branchlet; involucral bracts linear, obtuse to almost acute, the outer ones squarrose, innermost 8-11 mm long, all villous, the outer ones grey, the inner dark rusty brown towards apex; flowers 180-190 per head. *Perianth* 20-23 mm long, villous above base, then hirsute, pale yellow; limb 2.5 mm long, hirsute, dark grey, the apical hairs white. *Pistil* 22-26 mm long, glabrous, cream; pollen presenter narrow, 1 mm long, rusty brown. *Follicles* 3 or 4 per head, obliquely obovate, 9-12 mm long, loosely hirsute.

Selected collection examined. S of Gillingarra Rd, SE of Dandaragan, *E.A. Griffin* 5371 (PERTH).

Distribution. Occurs south-east of Gillingarra, Western Australia.

Habitat. Grows in sand over laterite in kwongan.

Flowering period. Flowers July-October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One. Known from two populations, one on a narrow road verge, the other on private property.

Etymology. Named from the Latin *fuscus* (dark) and *bractea* (a bract), in reference to the involucral bracts.

Discussion. Related most closely to *D. cuneata*, differing in the dark brown involucral bracts (the outermost squarrose) and the heads with more flowers that are smaller, with a grey perianth limb and small, dark pollen presenter. Flowers not scented. Follicles loosely attached.

Dryandra armata R. Br., Trans. Linn. Soc. London 10: 213 (1810) - *Josephia armata* (R. Br.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: King George Sound, [Western Australia], December 1801, *R. Brown* Iter Australiense 3416 (*holo*; BM; *iso:* K, MEL).

Distribution. A widespread, variable species occurring from Mt Lesueur to Albany and east to Israelite Bay.

There are two varieties.

1 Shrub to 1.5 m (usually below 1 m) with lignotuber; leaf lamina 8-20 mm wide; lobes 6-13 each side; involucral bracts tomentose to hirsute in upper half, glabrous or almost so below; perianth 25-32 mm long; limb 4-4.5 mm long; pistil 28-39 mm long ..... var. **armata**

1: Shrub to 3 m without lignotuber; leaf lamina 20-25 mm wide; lobes 5-8 each side; outer involucral bracts hirsute, inner ones pubescent; perianth 30-39 mm long; limb *c.* 5 mm long; pistil 35-42 mm long ..... var. **ignicida**

Dryandra armata R. Br. var. **armata**

D. favosa Lindl., Sketch Veg. Swan R. xxxiii (1840). *Type*: south-western Western Australia, per *Toward* (*holo:* CGE).

D. gilbertii S. Moore, J. Linn. Soc., Bot. 45: 211 (1920). *Type*: south-western Western Australia, *J. Gilbert s.n.* (*holo:* BM).

Dryandra armata var. **ignicida** A.S. George, var. nov.

Frutex rectus ad 3 m altus, sine lignotubero. Folii lamina 6-8 cm longa, 20-25 mm lata; lobi 5-8 in quoque margine, ad angulum *c.* 90°. Bracteae involucrales ad 20 mm longae, exteriores hirsutae, interiores pubescentes. Perianthium 30-39 mm longum; limbus *c.* 5 mm longus. Pistillum 35-42 mm longum; praebitor pollinis 3-3.5 mm longus.

Typus: Paterson Rd, W of Junction with Balls Rd, E of Woodanilling, Western Australia, *c.* 33°29'S, 117°33'E, *A.S. George* 16636 (*holo:* PERTH 04110358; *iso:* CANB, K).

Erect *shrub* to 3 m without lignotuber. *Leaf* lamina 6-8 cm long, 20-25 mm wide; lobes 5-8 each side, at *c.* 90°. *Involucral bracts* to 20 mm long, the outer hirsute, inner pubescent. *Perianth* 30-39 mm long; limb *c.* 5 mm long. *Pistil* 35-42 mm long; pollen presenter 3-3.5 mm long.

Selected collections examined. *c.* 3 km E of Wagin, *H. Demarz* 1531 (PERTH); Boyatup Hill, *A.S. George* 16158 (PERTH); Tutanning Nature Reserve, ESE of Pingelly, *G. Heinsohn* 23 (PERTH).

Distribution. Widespread from Pingelly to Katanning and east to Mt Ragged.

Habitat. Grows in sandy loam, granitic, quartzitic or lateritic soil in tall shrubland, often with emergent eucalypts.

Flowering period. July-September.

Conservation status. Not endangered.

Etymology. Specific epithet from the Latin *ignis* (fire) and the suffix *-cidus* (pertaining to killing), in reference to the plant being non-lignotuberous and killed by fire.

Discussion. Distinguished from var. *armata* especially in having no lignotuber, and usually in its larger leaves and flowers. At several localities the two are sympatric.

Dryandra hirsuta A.S. George, sp. nov.

D. armatae var. *ignicidae* A.S. George similis, sed plerumque hirsutiore, foliis majoribus grosse lobatis, et inflorescentia et folliculis majoribus, distinguitur. Folii lamina 5-13 cm longa, 15-35 mm lata; lobis 5-10 in quoque margine, oblique triangularibus, acuminatis, pungentibus; marginibus recurvis; petiolo 5-12 mm longo, hirsuto. Bracteae involucrales lanceolatae ad lineares, 22-32 mm longae. Perianthium 40-41 mm longum, limbo 5.5-6.5 mm longo. Pistillum 45-48 mm longum; praebitor pollinis 4-5 mm longus. Folliculi 9-11 mm longi, parce hirsuti.

Typus: Red Gum Pass Rd, just S of junction with Salt River Rd, Stirling Range National Park, Western Australia, 34°19'S, 117°47'E, 27 July 1986, *A.S. George* 16657 (*holo:* PERTH 04225805; *iso:* CANB, K).

Shrub to 2 m, without lignotuber. *Stems* tomentose and hirsute with spreading hairs. *Leaves* ± lanceolate to narrowly obovate, acute, pungent, deeply serrate to pinnatipartite, loosely hirsute and glabrescent except pits in lower surface; lamina 5-13 cm long, 15-35 mm wide; lobes 5-10 each side, obliquely triangular, acuminate, pungent; margins recurved; petiole 5-12 mm long, hirsute. *Inflorescence* terminal or on short lateral branchlet; involucral bracts lanceolate to linear, obtuse to acute, erect, tomentose, the outer ones with hirsute margins in upper half, the innermost 22-32 mm long; flowers *c.* 90-110 per head. *Perianth* 40-41 mm long, curled-pubescent above base, hirsute above, pale yellow-gold; limb 5.5-6.5 mm long, hirsute at base, otherwise glabrous. *Pistil* 45-48 mm long, curved, hirsute just above ovary, then glabrous; pollen presenter narrow, 4-5 mm long, ribbed. *Follicles* somewhat angular-ovate to obovate, 9-11 mm long, sparsely hirsute, shining.

Selected collections examined. Talyuberlup, *J.S. Beard* 7601 (PERTH); E side of Mt Toolbrunup, *A.S. George* 10874 (PERTH); Mt Warrungup, *K. Newbey* 1793 (PERTH).

Distribution. Restricted to the central and western parts of the Stirling Range.

Habitat. Grows in rocky sandy loam in tall shrubland and low open woodland.

Flowering period. May-October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. Named from the Latin *hirsutus* (having long, rather coarse hairs), in reference to the hairy stems, young leaves and involucral bracts.

Discussion. Resembles *D. armata* var. *ignicida* but has larger, more coarsely lobed leaves, larger inflorescence and fruit, and is generally more hairy, especially when young.

Dryandra pallida A.S. George, sp. nov.

Ad *D. cirsioides* Meisn. affinis, a qua foliis lobis paucioribus (3-5 in quoque margine), marginibus planis, viridibus pallidis; floribus cremeis; et pistillo glabro, praecipue differt.

Typus: 20 miles (32 km) E of Pingaring, Western Australia, *c.* 32°45'S, 118°56'E, 29 May 1969, *A.S. George* 9346 (*holo*: PERTH 04228472; *iso*: CANB, K, MEL).

Columnar *shrub* to 2 m, without lignotuber. *Stems* densely tomentose, at length glabrescent. *Leaves* broadly linear, serrate, acuminate; lamina usually 5-8 cm long, 2-3 cm wide, white-tomentose below with glabrous venation; margins flat to slightly recurved; lobes 3-5 each side, obliquely triangular, to 15 mm long; petiole 5-10 mm long, tomentose. *Inflorescence* sessile along branches; involucral bracts narrowly lanceolate, ± acute, 10-12 mm long, densely silky, glabrous inside; flowers 65-80 per head. *Perianth* 25-27 mm long, pale yellow, densely hirsute including limb; limb 4 mm long. *Pistil* 29-31 mm long, strongly outcurved, glabrous; pollen presenter narrow, 1.5 mm long, smooth. *Follicles* obovate to transversely elliptic, 8-10 mm long, loosely hirsute.

Selected collections examined. Mt Short, N of Ravensthorpe, *A.S. George* 4439 (PERTH); *c.* 3 km N of Nyabing, *K. Newbey* 768 (PERTH); 10 km S of Lake Grace, *R.D. Royce* 6686 (PERTH).

Distribution. Locally common in the southern central wheatbelt from Nyabing to Frank Hann National Park and north to Kulin and Holt Rock.

Habitat. Grows in lateritic soil, sometimes somewhat sandy, in kwongan.

Flowering period. May-July.

Conservation status. Not endangered.

Etymology. The epithet, from the Latin *pallidus* (pale), refers to the pale yellow flowers and the characteristic pale colour of dried specimens.

Discussion. May be recognized by the few-lobed leaves with flat margins, pale yellow flowers, hirsute perianth (including limb) and glabrous pistil.

Dryandra purdieana Diels, Bot. Jahrb. Syst. 35: 174 (1904). *Type*: Victoria Plains [Toodyay district], Western Australia, 29 August 1901, *L. Diels* 3972 (*lecto* (here chosen): B; *isolecto:* MEL).

Typification. There are two specimens on the type sheet at B, clearly from different plants. That chosen as lectotype agrees better with the protologue in its dimensions; the second specimen has more crowded, smaller leaves and smaller flowers. There is a single label in Diels' hand on the sheet. The specimen at MEL agrees with the lectotype.

Dryandra xylothemelia A.S. George, sp. nov.

Ad *D. cirsioides* Meisn. affinis, a qua habitu lignotubero, interdum surculis, et foliorum lobis angustis late dispositis, praecipue differt. Lobi foliorum 5-9 in quoque latere, marginibus arcte revolutis. Flores 80-100 per capitulum. Perianthium 20-27 mm longum, limbo 5-6.5 mm longo. Pistillum 22-33 mm longum, hirsutum supra basin, aliter glabrum; praebitor pollinis angustus, costatus, 2.5-4 mm longus.

Typus: 14 km N of Newdegate-Lake King road on Holt Rock South Rd, Western Australia, 32°58'S, 119°23'E, 11 October 1994, *A.S. George* 17238 (*holo:* PERTH 04228731; *iso*: AD, CANB, K, MEL, NSW).

Shrub to 1 m, often sprawling, with lignotuber, often suckering. *Stems* obscured by leaf bases, tomentose. *Leaves* crowded, pinnatipartite, 7-12 cm long, 4-5.5 cm wide, glabrous above, tomentose below; lamina along midrib linear; lobes 5-9 each side, linear, pungent, widely divergent to somewhat recurved; margins revolute; petiole 5-10 mm long. *Inflorescence* sessile or on short lateral branchlet, on older stems; involucral bracts lanceolate, acute to obtuse, not spreading, glabrous with pubescent apex, the innermost to 15-22 mm long; flowers 80-100 per head. *Perianth* 20-27 mm long, villous above base, then hirsute, pale yellow; limb 5-6.5 mm long, sparsely hirsute to almost glabrous. *Pistil* 22-33 mm long, straight then strongly curving outwards, hirsute above base, then glabrous, cream; pollen presenter narrow, ribbed, 2.5-4 mm long. *Follicles* oblong but contracted near base, 9 mm long, loosely hirsute, glabrescent, striate.

Selected collections examined. Dragon Rocks Nature Reserve, 9 Dec. 1993, *R. Buehrig* (PERTH); 16 km W of Lake King township, *P.G. Wilson* 5762 (PERTH).

Distribution. Occurs between Newdegate and Frank Hann National Park and north towards Hyden.

Habitat. Grows in sandy loam, usually over laterite, in kwongan and mallee-kwongan.

Flowering period. September-October.

Conservation status. Not endangered.

Etymology. The specific epithet is derived from the Greek *xylon* (wood) and *themelios* (of a foundation or base), this species having a lignotuber in contrast to its close relative *D. cirsioides*.

Discussion. Very similar to *D. cirsioides* but may be distinguished by the low, often suckering habit and narrow, widely spaced leaf lobes. Superficially resembles *D. serratuloides* subsp. *meganotia* but distinguished especially by the larger, less hairy fruit.

Dryandra acanthopoda A.S. George, sp. nov.

Ad *D. polycephalam* Benth. affinis, a qua habitu densiore foliis latioribus (10-15 mm latis) lobis paucioribus (5-10 in quoque margine) et in petiolum lobis subulatis, et floribus majoribus (perianthium 26-30 mm longum, pistillum 30-33 mm longum), differt.

Typus: Wingedine Nature Reserve, W of Woodanilling, Western Australia, 33°36'S, 117°14'E, 26 July 1986, *A.S. George* 16647 (*holo*: PERTH 03262847, *iso*: CANB, MEL, NSW, PERTH 03262855, 03262863).

Shrub to 2 m with many spreading branches. *Stems* appressed-pubescent, soon glabrous. *Leaves* linear, curved, serrate, acuminate; lamina 5-13 cm long, 10-15 mm wide, white-tomentose below; margins recurved, with 5-10 teeth each side and 3-6 spine-like lobes on petiole; petiole to 15 mm long. *Inflorescences* on short lateral branchlets, crowded; involucral bracts lanceolate, the outer subulate and squarrose, the inner acute, to 15 mm long, appressed-pubescent outside; flowers 50-65 per head. *Perianth* straight, 26-30 mm long, pale yellow, curled-tomentose above base, silky on claws; limb 3-3.5 mm long, glabrous. *Pistil* straight, 30-33 mm long, glabrous except ovary; pollen presenter 1 mm long. *Follicles* up to 6, obliquely ovate, 9-13 mm long, sparsely hairy.

Selected collections examined. N of Woodanilling, 7 Oct. 1986, *R. Garstone* (PERTH); between Katanning and Kwobrup, 21 Dec. 1964, *F.W. Humphreys* (PERTH)

Distribution. Restricted to the Woodanilling-Katanning area.

Habitat. Grows in lateritic soil in tall closed shrubland, sometimes with emergent *Eucalyptus drummondii* or *E. wandoo.*

Flowering period. July-October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Three.

Etymology. Named from the Greek *acantha* (a thorn or prickle) and *podos* (a foot), in reference to the prickly leaf base and petiole.

Discussion. Closely related to *D. polycephala* but more bushy in habit, the leaves broader with fewer main lobes but many subulate lobes on the petiole, and the flowers larger. Follicles firmly attached; opening when dried. A collection from near Woodanilling (7 Oct. 1986, *R.Garstone*, PERTH) has small flowers, with the involucral bracts 9-10 mm long, perianth *c.* 18 mm long and pistil 22-23 mm long.

Dryandra squarrosa R. Br., Suppl. Prodr. Fl. Nov. Holl. 38 (1830) - *Josephia squarrosa* (R. Br.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: near King George Sound, [Western Australia], 1829, *W. Baxter* (*holo*: BM; *iso:* K).

Distribution. Occurs widely in south-western Western Australia from Bindoon south to the Whicher Range and east almost to Albany.

Habitat. Grows in lateritic soil, rarely in sand or clay-loam, in eucalypt forest and woodland.

There are two subspecies.

1 Perianth limb hirsute; perianth 19-24 mm long ..... subsp. **squarrosa**

1: Perianth limb glabrous; perianth 18-19 mm long ..... subsp. **argillacea**

Dryandra squarrosa R. Br. subsp. **squarrosa**

D. carduacea Lindl., Sketch Veg. Swan R. xxxiii (1840) - *Josephia carduacea* (Lindl.) Kuntze, Revis. Gen. Pl. 2: 278 (1891). *Type*: south-western Western Australia, 183-, *J. Drummond s.n.* (*holo:* CGE).

D. carduacea var. *angustifolia* Hook., Bot. Mag. 73: t. 4317 (1847). *Type*: cultivated at Royal Botanic Gardens, Kew, from seed collected in south-western Western Australia by J. Drummond (*holo*: K).

Most *leaves* 8-12 mm wide; teeth 5-10 each side. *Perianth* 21-24 mm long; limb 2.5-3.5 mm long, hirsute. *Pistil* 22-26 mm long; pollen presenter 0.7-1.5 mm long.

Distribution. Occurs throughout the range of the species except near the Whicher Range.

Dryandra squarrosa subsp. **argillacea** A.S. George, subsp. nov.

Folia plerumque 5-9 mm lata lobis 3-6 in quoque margine. Perianthium 18-19 mm longum, limbo 2 mm longo glabro. Pistillum 22-24 mm longum; praebitor pollinis 0.8-1 mm longus.

Typus: near Tutunup, Western Australia, 26 June 1973, *A.S. George* 11657 (*holo:* PERTH 04110609; *iso:* CANB, K).

Most *leaves* 5-9 mm wide; teeth 3-6 each side. *Perianth* 18-19 mm long; limb 2 mm long, glabrous. *Pistil* 22-24 mm long; pollen presenter 0.8-1 mm long.

Selected collections examined. Smith Rd, Whicher Range, *A. Cochrane* 261 (PERTH); Ruabon Rd, *L. Nunn* 535 (PERTH).

Distribution. Occurs on the coastal plain close to the western base of the Whicher Range.

Habitat. Grows in winter-wet clay over ironstone in open to tall shrubland.

Flowering period. June-November.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The subspecific epithet, from the Latin *argillaceus* (growing in clay), refers to the soil of the natural habitat which contrasts with the lateritic gravel usually inhabited by subsp. *squarrosa*.

Discussion. Differs consistently from the other subspecies in the smaller perianth with a glabrous limb. The leaves are usually smaller and more slender than those of subsp. *squarrosa*.

Dryandra wonganensis A.S. George, sp. nov.

Ad *D. hewardianam* Meisn. et *D. trifontinalem* A.S. George affinis, a quibus foliorum lobis angustioribus, petiolo prominente flavo, et floribus majoribus (perianthio 32-33 mm longo, pistillo 32-33 mm longo), differt.

Typus: NW of Wongan Hills on Piawaning road, Western Australia, 30°51'S, 116°40'E, 4 August 1986, *A.S. George* 16763 (*holo:* PERTH 03322807; *iso:* AD, CANB, K, MEL, NSW, PERTH 03322815).

Sprawling to erect *shrub* to 3 m, without lignotuber. *Stems* with a few appressed hairs, soon glabrous. *Leaves* linear, acuminate, often strongly curved, pinnatifid; lamina 4-16 cm long, 9-18 mm wide, closely tomentose below; margins revolute; lobes 4-9 each side, narrowly triangular, often slightly falcate; petiole to 15 mm long, broad and prominent on floral leaves. *Inflorescence* on lateral branchlet to 10 mm long; involucral bracts lanceolate, acute, to 12 mm long, the outer ones glabrous with shortly ciliate margins, the inner ones pubescent towards apex; flowers 45-50 per head. *Perianth* 32-33 mm long, pale yellow, curled-hirsute above base, silky above; limb 3-5 mm long, glabrous. *Pistil* straight, 32-33 mm long, glabrous except a few hairs on ovary; pollen presenter 1.8-2 mm long. *Follicles* ovate-oblong, 7-8 mm long, sparsely hairy, prominently veined.

Selected collections examined. NW of Wongan Hills, *F. Lullfitz* 1665 (PERTH); Wongan Hills, *K. Newbey* 2000 (PERTH).

Distribution. Restricted to the Wongan Hills and nearby low rises.

Habitat. Grows in lateritic soil in open woodland and dense scrub.

Flowering period. August-October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. Named from the town and range of hills near its natural habitat, together with the Latin suffix *-ensis* indicating origin or place.

Discussion. Similar to *D. trifontinalis* and *D. hewardiana* but differs in the narrow leaf lobes, prominent yellowish petiole and larger flowers without scent.

Dryandra trifontinalis A.S. George, sp. nov.

Ab *D. wonganense* A.S. George lobis foliorum majoribus latioribusque et floribus minoribus (perianthio 24-25 mm longo, pistillo 25-26 mm longo) differt; ab *D. hewardiana* Meisn. ramulis floralibus brevioribus, bracteis involucralibus ± glabris praeter marginibus ciliatis, et perianthii limbo et praebitore pollinis breviore, differt.

Typus: W of Three Springs on Nebru Rd, Western Australia, *c.* 29°32'S, 115°42'E, 6 August 1986, *A.S. George* 16789 (*holo:* PERTH 03322742; *iso:* CANB, K, MEL, NSW, PERTH 03322750).

Openly branched *shrub* to 2 m, without lignotuber. *Stems* sparsely hirsute, soon glabrous. *Leaves* broadly linear, acute, pungent, coarsely serrate; lamina 3-16 cm long, 10-18 mm wide, closely tomentose below; margins recurved; teeth 5-10 each side, broadly obliquely triangular, pungent; petiole to 10 mm long, often absent. *Inflorescence* on lateral branchlet to 1 cm long, occasionally terminal; involucral bracts ovate to lanceolate, acute, to 10 mm long, glabrous or scurfy, with shortly ciliate margins; flowers 55-65 per head. *Perianth* 24-25 mm long, pale yellow, curled-tomentose above base, hirsute above; limb 3-4 mm long, glabrous. *Pistil* ± straight, 25-26 mm long, glabrous except silky apex of ovary; pollen presenter 1.8-2 mm long. *Follicles* oblong to ovate, 6-9 mm long, sparsely hairy, prominently veined.

Selected collections examined. W of Three Springs, *J.S. Beard* 7251 (PERTH); near Three Springs, *W.E. Blackall* 4878 (PERTH).

Distribution. Restricted to a few populations near Three Springs.

Habitat. Grows in lateritic soil in low woodland.

Flowering period. August-September.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The specific epithet is a Latin version of the name of the nearby town of Three Springs (*tri-*, three-, and *fontinalis*, of a spring).

Discussion. Most closely related to *D. wonganensis*, differing in the coarsely-lobed leaves and smaller flowers. Also similar to *D. hewardiana* which has the inflorescences on longer branchlets, pubescent involucral bracts with densely ciliate margins, a smaller perianth limb and smaller pollen presenter.

Dryandra stricta A.S. George, sp. nov.

Ab *D. hewardiana* Meisn. foliis confertis strictis angustis (4-9 mm latis dentibus in quoque latere 8-18) breviter dentatis, inflorescentia sessili, et limbo perianthii hirsuto, differt.

Typus: Bunny Rd, N of junction with Skipper Rd (NE of Eneabba), Western Australia, *c.* 29°35'S, 115°27'E, 6 August 1986, *A.S. George* 16793 (*holo:* PERTH 03322769; *iso:* CANB., K).

Bushy *shrub* to 3 m, without lignotuber. *Stems* glabrous. *Leaves* linear, ± straight, acute, pungent, serrate; lamina 5-20 cm long, 4-9 mm wide, white-tomentose below; margins revolute; teeth 8-18 each side, obliquely triangular, pungent; petiole to 5 mm long. *Inflorescence* sessile, rarely on branchlet to 5 mm long; involucral bracts lanceolate to narrowly triangular, acute to obtuse, to 13 mm long, appressed-pubescent, with densely ciliate margins; flowers 45-85 per head. *Perianth* 23-25 mm long, pale yellow, curled-tomentose above base, hirsute above; limb 2.5-3 mm long, hirsute. *Pistil* straight, 27-31 mm long, glabrous except ovary; pollen presenter 1.2-1.5 mm long, finely ribbed. *Follicles* obovate to orbicular, 6-8 mm long, sparsely hairy, prominently veined.

Selected collections examined. 14.5 km N of Badgingarra on Brand Hwy, *A.S. George* 16823 (PERTH); Alexander Morrison National Park, *E.A. Griffin* 1507 (PERTH); Coorow-Greenhead Rd, W of Brand Hwy, *S. Patrick* 1351 (PERTH).

Distribution. Occurs between Three Springs and Badgingarra.

Habitat. Grows on lateritic hills in kwongan, occasionally in sand over gravel or clay.

Flowering period. August-October.

Conservation status. Not endangered.

Etymology. The epithet, from the Latin *strictus* (straight), refers to the leaves which are usually straighter than those of related species.

Discussion. Related to *D. hewardiana* but recognized by the densely leaved branches, ± straight, narrow, shortly toothed leaves, sessile inflorescence and hirsute perianth limb.

Dryandra echinata A.S. George, sp. nov.

Ad *D. polycephalam* Benth. affinis, a qua habitu minore densiore, foliis latioribus (6-15 mm latis) lobis majoribus, et floribus majoribus (perianthio 17-23 mm longo, pistillo 22-26 mm longo), differt.

Typus: near Red Gully Rd turnoff, Brand Hwy, Western Australia, *c.* 31°06'S, 115°46'E, 7 August 1986, *A.S. George* 16829 (*holo:* PERTH 03261492; *iso:* CANB, K, MEL, PERTH 03262839).

Shrub to 3 m, without lignotuber. *Stems* erect to spreading, sparsely glandular-tomentose, glabrescent. *Leaves* linear, recurved, acuminate; lamina 3-15 cm long, 6-15 mm wide, sparsely glandular-pubescent above and on midrib below but soon glabrous there, closely tomentose below; margins recurved, with 9-25 triangular teeth each side to 7 mm long; petiole 8-10 mm long, almost glabrous. *Inflorescence* sessile or on short branchlet, crowded towards branch apex; involucral bracts narrowly lanceolate, acuminate, to 10 mm long, appressed-tomentose outside with ciliate margins, glabrous towards apex; flowers 45-55 per head. *Perianth* 17-23 mm long, yellow with deep yellow limb, crisped-hirsute above base becoming silky above; limb 2-2.5 mm long, glabrous or with a few hairs near base. *Pistil* straight, 22-26 mm long, glabrous except ovary; pollen presenter *c.* 0.8 mm long, slightly swollen at base. *Follicles* obovate to rounded-oblong, 6-9 mm long, sparsely hairy, striate.

Selected collections examined. Boonanarring Brook, *J.J. Alford* 294 (PERTH); New Norcia, *C.A. Gardner* 614 (PERTH); Moore River National Park, *R.D. Royce* 9449 (PERTH).

Distribution. Occurs between Regans Ford, New Norcia and Gingin.

Habitat. Grows in lateritic or sandy soil in kwongan or low open woodland.

Flowering period. July-October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Three.

Etymology. The Latin *echinatus* (armed with many prickles or spines) refers to the very prickly habit of the plant due to the crowded leaves with pungent lobes.

Discussion. Related to *D. polycephala* but differs in the smaller, compact habit, broader leaves with larger lobes, and larger flowers. The glandular indumentum of the new growth is unusual. Variable in size of leaves and their lobes and the flowers. *Newbey* 2317 has larger flowers (perianth 25 mm long, pistil 29 mm). Referred to as *Dryandra* sp. *A* in N.G. Marchant *et al.*, "Fl. Perth Region" 1: 327 (1987)

Dryandra polycephala Benth., Fl. Austral. 5: 570 (1870) - *Josephia polycephala* (Benth.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: south-western Western Australia, 184-, *J.Drummond* 2: 342 (*lecto* (here chosen): K; *isolecto*: BM, NY, PERTH).

Typification. Bentham cited two collections by Drummond, viz. '*1st coll., 2nd coll. n. 342*'. At K there are seven sheets of the taxon collected by Drummond, all except one with the annotation 'named by Mr Bentham' and all agreeing well with the protologue. One has Drummond's original tag 342 attached, and it is labelled, in error, *Dryandra carlinoides* (a Meisner name). One has the number '42', a number referred to by Drummond in a letter to Hooker of 7 September 1842 but not cited by Bentham. Another sheet has the number 342 pencilled in. All the others have no number. I have selected as lectotype the sheet with the number 342 pencilled in. The isolectotypes at BM, NY and PERTH are numbered 342. A sheet at NSW has the remains of a Drummond tag attached and may also be an isolectotype.

Dryandra subpinnatifida C.A. Gardner, J. Roy. Soc. W. Australia 47: 58 (1964). *Type*: W of Popanyinning, Western Australia, Oct. 1962, *F. Lullfitz s.n.* (*holo:* PERTH; *iso*: PERTH).

This species has two varieties.

1 Flowers 40-50 per head; involucral bracts to 20 mm long; limb 3.2-3.3 mm long, densely hirsute with longer hairs towards apex; pistil 37-39 mm long; pollen presenter noticeably thickened at base ..... var. **subpinnatifida**

1: Flowers *c.* 60 per head; involucral bracts to 12 mm long; limb *c.* 2.5 mm long, glabrous except a few hairs at base; pistil 34-36 mm long; pollen presenter scarcely thickened ..... var. **imberbis**

Dryandra subpinnatifida C.A. Gardner var. **subpinnatifida**

Involucral bracts to 20 mm long; flowers *c.* 40 per head; floral bracts linear, obtuse, 1 mm long, hirsute. *Perianth* 27-28 mm long; limb 3.2-3.7 mm long, hirsute, more densely towards apex. *Pistil* 37-42 mm long; pollen presenter 1-1.2 mm long, cylindrical to narrowly ovoid.

Distribution. Occurs between Pingelly and Narrogin.

Dryandra subpinnatifida var. **imberbis** A.S. George, var. nov.

Bracteae involucrales marginibus ciliatis apicibus subulatis pubescentibus, longissimis 10-12 mm longis; flores *c.* 60 per capitulum; bracteae florales lineares, obtusae, 3.5 mm longae, apice et marginibus ad apicem hirsutis. *Perianthium* 25-26 mm longum, supra basin crispo-lanatum, supra hirsutum; limbus *c.* 2.5 mm longus, glaber praeter pilos paucos ad basin. *Pistillum* 32-36 mm longum; praebitor pollinis cylindricus basi parum tumidus, quam stylus vix crassior, vix costatus, 1-1.4 mm longus.

Typus: W of Peringillup, Western Australia, 30 September 1971, *A.S. George* 11068 (*holo:* PERTH 04110560; *iso:* CANB, K, MEL, PERTH 04110579).

Involucral bracts with ciliate margins and subulate, pubescent tips, the longest 11-12 mm long; flowers *c.* 60 per head; floral bracts linear, obtuse, 3.5 mm long, hirsute on upper margins and apex. *Perianth* 25-26 mm long, curled-woolly above base, hirsute above; limb *c.* 2.5 mm long, glabrous except a few hairs at base. *Pistil* 32-36 mm long; pollen presenter cylindrical with slightly swollen base, hardly thicker than style, scarcely ribbed, 1-1.4 mm long.

Selected collections examined. Near Boddington, 14 Aug. 1982, *D. Backshall* (PERTH); Mt Saddleback, 15 Nov. 1904, *A. Morrison* (PERTH); E of Bowelling, *M. Pieroni* 95/4 (PERTH); *c.* 12 km W of Broomehill, *R.D. Royce* 4804 (PERTH).

Distribution. Occurs between Boddington and Broomehill.

Habitat. Grows in gravelly loam over laterite in thick scrub, sometimes with emergent *Eucalyptus drummondii.*

Flowering period. September-October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Three.

Etymology. Named from the Latin *imberbis* (not bearded), in reference to the glabrous or almost glabrous perianth limb.

Discussion. The varieties overlap in distribution but have not been recorded growing together. The glabrous perianth limb readily distinguishes var. *imberbis.* Collections from Bowelling, Boddington and Mt Saddleback are from low (*c.* 50 cm high), mounded plants and may represent another variety. In the Bowelling population the involucral bracts are red, and hybridization has occurred with an adjacent population of *D. squarrosa* subsp. *squarrosa* (M. Pieroni, pers. comm.).

Dryandra longifolia R. Br., Trans. Linn. Soc. London 10: 215 (1810) - *Josephia longifolia* (R. Br.) Poir., Dict. Sci. Nat. 24: 245 (1822). *Type*: Lucky Bay [E of Esperance, Western Australia], January 1802, *R. Brown* Iter Australiense 3424 (*holo:* BM; *iso*: K, MEL (2 sheets), PERTH).

Dryandra longifolia has three subspecies.

1 Perianth 37-40 mm long; limb 4.6-5.5 mm long; pistil 38-48 mm long; pollen presenter 2.8-3.5 mm long; involucral bracts 25-30 mm long ..... subsp. **longifolia**

1: Perianth 23-29 mm long; limb 2.5-4 mm long; pistil 28-35 mm long; pollen presenter 1.2-2 mm long; involucral bracts to 20 mm long

2 Perianth limb 2.5-3 mm long; pollen presenter 1.2-1.6 mm long; involucral bracts straight ..... subsp. **calcicola**

2: Perianth limb 3.5-4 mm long; pollen presenter *c.* 2 mm long; involucral bracts recurved ..... subsp. **archeos**

Dryandra longifolia R. Br. subsp. **longifolia**

Shrub to 1.5 m. *Involucral bracts* acute, straight or slightly recurved, hirsute and ± viscid outside, the innermost ones 25-30 mm long. *Perianth* 37-40 mm long; limb 4.6-5.5 mm long. *Pistil* 38-48 mm long; pollen presenter 2.8-3.5 mm long.

Distribution. Occurs from Cape le Grand to Cape Paisley and on Mondrain Island of the Recherche Archipelago.

Habitat. Grows in coarse sandy loam by granitic slopes, in scrub.

Flowering period. June-October.

Dryandra longifolia subsp. **archeos** A.S. George, subsp. nov.

Ab subspeciebus aliis perianthio minus hirsuto pilis ± appressis, bracteis involucralibus hirsutioribus apice recurvo differt. Ab subsp. *longifolia* praebitore pollinis minore et ab subsp. *calcicola* A.S. George majore differt.

Typus: S end, Mt Ragged, Western Australia, *c.* 33°28'S, 123°28'E, 1 July 1976, *A.S. George* 14308 (*holo:* PERTH 01108204; *iso:* CANB, K).

Shrub to 1.5 m. *Involucral bracts* acuminate, recurved, appressed-hirsute, ?not viscid, the innermost ones *c.* 20 mm long. *Perianth* 27-29 mm long; limb 3.5-4 mm long. *Pistil* 33-34 mm long; pollen presenter 2 mm long.

Selected collections examined. Summit of Tower Peak, Mt Ragged, *A.S. George* 16127 (PERTH); SW slope of Mt Ragged, *P.G. Wilson* 5853 (PERTH).

Distribution. Confined to Mt Ragged.

Habitat. Grows among quartzite boulders on steep slopes, in dense scrub.

Flowering period. April-June.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two. Mt Ragged is within a Nature Reserve but the plants are vulnerable to *Phytophthora.*

Etymology. The epithet is from the Greek *arche* (first) and *eos* (dawn). Growing on Mt Ragged near Israelite Bay, at the eastern limit of dryandras in the wild, this is one of the first to receive sunlight each day.

Discussion. Differs from the other subspecies in having the perianth with sparser, more appressed hairs, and in the involucral bracts being more hairy, with a more acuminate, recurved tip, and probably not viscid. The pollen presenter is smaller than that of subsp. *longifolia* but larger than that of subsp. *calcicola.* The new leaves are sparsely appressed-hirsute but very soon glabrous above.

Dryandra longifolia subsp. **calcicola** A.S. George, subsp. nov.

Ab subspeciebus aliis limbo perianthii et praebitore pollinis, etiam plerumque involucro, minore, differt. Frutex ad 3 m altus. Bracteae involucrales ± acutae, rectae, extus appresso-hirsutae, ?viscidae, intimae 14-20 mm longae. Perianthium 23-27 mm longum, patente-hirsutum; limbus 2.5-3 mm longus. Pistillus 28-35 mm longus; pollinis praebitor 1.2-1.6 mm longus.

Typus: W of Twilight Beach, W of Esperance, Western Australia, 33°54'S, 121°49'E, 13 October 1994, *A.S. George* 17243 (*holo:* PERTH 04228812; *iso:* AD, CANB, K, MEL, NSW, PERTH 04228820, 04228839).

Shrub to 3 m. *Involucral bracts* ± acute, straight, appressed-hirsute outside, ?viscid, the innermost 14-20 mm long. *Perianth* 23-27 mm long, spreading-hirsute; limb 2.5-3 mm long. *Pistil* 28-35 mm long; pollen presenter 1.2-1.6 mm long.

Selected collection examined. Near Esperance, *K. Newbey* 2468 (PERTH).

Distribution. Occurs to the west of Esperance Bay.

Habitat. Grows in sand over limestone, in low kwongan.

Flowering period. July-September.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One. The known populations are close to roads. One is on the outskirts of Esperance townsite, the others are regenerating from a recent fire and have not yet set many seed.

Etymology. Named from the Latin *calx* (lime) with the indeclinable suffix *-cola*, in reference to the soil of the natural habitat. This is one of few dryandras to grow in calcareous soil.

Discussion. The small perianth limb and pollen presenter and the non-recurved involucral bracts are the main characters distinguishing this from the other subspecies.

Dryandra borealis A.S. George, sp. nov.

Ad *Dryandram armatam* R. Br. similis, a qua bracteis involucralibus majoribus (30-35 mm longis) exterioris glabris interioris appresso-pubescentibus marginibus ciliatis, limbo perianthii longiore (7-8.5 mm longo) et praebitore pollinis longiore (4.5-6 mm longo), praecipue differt.

Typus: 27 miles [*c.* 35 km] E of Kalbarri on road to Ajana, Western Australia, 8 September 1966, *A.S. George* 7930 (*holo*: PERTH 03260208; *iso:* CANB, MEL).

Sprawling *shrub* to 1 m with lignotuber, or erect to 2.5 m without lignotuber. *Stems* closely pubescent. *Leaves* broadly linear, pinnatifid, acute, pungent; lamina 4-9 cm long, 12-30 mm wide, glabrous below except fine pits; margins flat to slightly recurved; lobes 5-12 each side, slightly falcate, pungent; petiole 0-2 mm long. *Inflorescence* on short lateral branchlet or terminal; involucral bracts ovate to linear, obtuse, 30-35 mm long, the outer ones ± glabrous, the inner ones appressed-pubescent and with ciliate margins; flowers 30-50 per head. *Perianth* 32-35 mm long, golden, hirsute, the limb

glabrescent towards apex; limb 7-8.5 mm long. *Pistil* straight to gently bowed, 39-47 mm long, hirsute in lower third; pollen presenter 4.5-6 mm long, finely ribbed. *Follicles* ovate to obovate, 8-13 mm long, loosely hirsute.

Distribution. Occurs in two disjunct areas and represented by a subspecies in each, one centred on the lower Murchison River, the other in the Three Springs area.

Etymology. Named from the Latin *borealis* (northern), in reference to the distribution, this being one of the northernmost species in the genus.

Discussion. Differs from *D. armata* in the narrower leaf lobes, larger, less hairy involucral bracts and larger flowers. There are two subspecies.

1 Shrub with lignotuber; perianth limb 7.5-8.5 mm long ..... subsp. **borealis**
1: Shrub without lignotuber; perianth limb 7-7.5 mm long ..... subsp. **elatior**

Dryandra borealis A.S. George subsp. **borealis**

Sprawling *shrub* to 1 m, with lignotuber. *Perianth* limb 7.5-8.5 mm long.

Selected collections examined. Between Northampton and Lynton, *W.E. Blackall* 2685 (PERTH); Ajana, *C.A. Gardner* 8597 (PERTH); Yuna, *W. Rogerson* 348 (PERTH).

Distribution. Relatively common between Kalbarri, Northampton and Yuna.

Habitat. Grows in pale yellow sand and in sand over laterite or sandstone, in kwongan.

Flowering period. August-September.

Conservation status. Not endangered.

Discussion. The collection *Blackall* 2685 from between Northampton and Lynton (PERTH) has unusually small flowers (pistil 31 mm long) and may have been collected in a dry season. One by *J. Long* 38 (PERTH) has leaves to 11 cm long and 35 mm wide and the perianth limb 9.5-10 mm long.

Dryandra borealis subsp. **elatior** A.S. George, subsp. nov.

Frutex ramosissimus ad 2.5 m altus, sine lignotubere. Perianthii limbus 7-7.5 mm longus.

Typus: SW of Three Springs, Western Australia, 29°35'S, 115°41'E, 6 August 1986, *A.S. George* 16787 (*holo:* PERTH 03322793; *iso:* CANB, K, MEL).

Bushy *shrub* to 2.5 m, without lignotuber. *Perianth* limb 7-7.5 mm long.

Selected collections examined. Between Three Springs and Mingenew, *J.S. Beard* 1680 PERTH); S of Mingenew, *A.S. George* 11680 (CANB, MEL, NSW, PERTH).

Distribution. Restricted to several small populations west and north of Three Springs.

Habitat. Grows on lateritic rises in tall scrub and low open woodland.

Flowering period. August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. Subspecific epithet is the comparative of the Latin adjective *elatus* (tall), this subspecies growing much taller than subsp. *borealis*.

Discussion. Distinguished from subsp. *borealis* mainly by the larger, non-lignotuberous habit but also usually has fewer leaf lobes, fewer flowers per head and the pistil hirsute for a shorter distance.

Ser. 3 *Marginatae*

Dryandra ser. *Marginatae* (Meisn.) A.S. George, stat. nov.

Dryandra § *Marginatae* Meisn. in A.L.P.P. de Candolle, Prodr. 14: 473 (1856). *Type*: *D. pulchella* Meisn., *lecto* (here chosen).

Bushy *shrubs* without lignotuber. *Leaves* linear, closely pinnatifid. *Inflorescence* ± sessile, on old stems, not conspicuous; involucral bracts shorter than flowers. *Perianth* straight with limb incurved in bud. *Pistil* incurved, much longer than perianth, looped out prominently before anthesis; pollen presenter ovoid. *Old flowers* persistent. *Follicles* obovate, usually remaining closed until burnt. *Seed* body basal; wing notched.

A single species restricted to the Wongan Hills area. In proposing an infrageneric classification for the genus, Meisner (1856) chose not to give a rank to his groups below the level of subgenus. Here they are formally given the rank of scries.

Typification. Meisner included seven species in § *Marginatae*; in the present treatment these are distributed among six series. His description of the leaves is quite appropriate for them all. *Dryandra pulchella* is selected as lectotype, since the others can all, except *D. elegans* Meisn., be placed in series named prior to the present work. *D. elegans* is a synonym of *D. tenuifolia* which has fewer, less crowded leaf lobes with wider sinuses than *D. pulchella*, hence Meisner's name is retained for the latter.

Ser. 4 *Folliculosae*

Dryandra ser. *Folliculosae* A.S. George, ser. nov.

Frutices cum vel sine lignotubere. Folia pinnatisecta, marginibus revolutis. Receptaculum prominenter convexum. Inflorescentia terminalis, conspicua; bracteae involucrales quam floribus breviores. Perianthium rectum; limbus antea anthesin ?incurvus. Pistillum incurvum, perianthium excedens; praebitor pollinis incrassatus, costatus. Flores veteres persistentes. Folliculi numerosi, valde affixi, cuneati.

Typus: *D. fraseri* R. Br.

Shrubs with or without lignotuber. *Leaves* pinnatisect; margins revolute. *Inflorescence* terminal, conspicuous; involucral bracts shorter than flowers; receptacle very convex. *Perianth* straight; limb ?incurved before anthesis. *Pistil* incurved, exceeding perianth; pollen presenter slightly thickened, ribbed. *Old flowers* persistent. *Follicles* many, firmly attached, cuneate.

Monotypic. Follicles usually prominent.

Etymology. Named from the Latin *folliculus* (a follicle) with the suffix *-osus* (indicating abundance), in reference to the follicles usually being quite numerous in the confructescence.

Dryandra fraseri R. Br., Suppl. Prodr. Fl. Nov. Holl. 39 (1830) - *Josephia fraseri* (R. Br.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: Swan River, [Western Australia], March 1827, *C. Fraser* (*holo:* BM; *iso:* K).

A variable species, here divided into 3 varieties.

1 Perianth claws pubescent to hirsute; shrub to 1 m with lignotuber ..... var. **fraseri**
1: Perianth claws glabrous or sparsely pubescent
2 Pistil 30-35 mm long; shrub to 1 m with lignotuber ..... var. **ashbyi**
2: Pistil 38-42 mm long; shrub to 6 m without lignotuber ..... var. **oxycedra**

Dryandra fraseri R. Br. var. **fraseri**

Shrub to 1 m, with lignotuber. *Involucral bracts* pubescent at least in upper half to one-third. *Perianth* claws pubescent to hirsute. *Pistil* 30-37 mm long.

Distribution. Widespread from near Geraldton to Cranbrook and inland to Manmanning, Kellerberrin and Corrigin.

Habitat. Grows in gravelly clay, sandy loam and granitic soil, in kwongan and woodland.

Flowering period. July-September.

Dryandra fraseri var. **ashbyi** (B.L. Burtt) A.S. George, stat. et comb. nov.

Dryandra ashbyi B.L. Burtt, Kew Bull. 1939, 183 (1939). *Type*: cultivated at Blackwood, S.A., from seed collected at Yuna, 30-40 miles [48-62 km] NE of Geraldton, Western Australia, 193-, *E. Ashby* 39 (*holo:* K; possible *iso:* NSW).

Shrub to 1 m, with lignotuber. *Involucral bracts* glabrous to prominently pubescent. *Perianth* claws glabrous or sparsely pubescent. *Pistil* 30-35 mm long.

Distribution. Occurs from the Geraldton area north to Kalbarri and inland to Yuna.

Habitat. Grows in sandy loam or rocky loam in open shrubland and kwongan.

Flowering period. May-July.

Conservation status. Not endangered.

Discussion. Differs from var. *fraseri* in the glabrous or almost glabrous perianth claws. The leaf lobes are fewer (4-8 each side) than in southern, typical populations of var. *fraseri* but similar to populations of the latter from the Yandanooka-Arrowsmith area. The involucral bracts tend to be wider and vary from almost glabrous to prominently pubescent, the hairs usually very dark. There is far too much variation in the indumentum of the involucral bracts for this taxon to be recognized at specific rank.

Dryandra fraseri var. **oxycedra** A.S. George, var. nov.

Ab subspeciebus aliis frutice elatiore (ad 6 m alto) sine lignotubero, foliis 25-40 mm latis, bracteis involucralibus glabris praeter pilis atris appressis ad apicibus, perianthii unguibus glabris vel parce pubescentibus, et pistillo 38-42 mm longo, differt.

Typus: SW of Three Springs, *c.* 29°34'S, 115°43'E, Western Australia, 1986, *A.S. George* 16788 (*holo:* PERTH 04228901; *iso:* CANB, K, NSW).

Shrub to 6 m without lignotuber. *Leaves* 25-40 mm wide. *Involucral bracts* glabrous except short appressed dark hairs on tips. *Perianth* claws glabrous or sparsely pubescent. *Pistil* 38-42 mm long.

Selected collection examined. W of Three Springs, *H. Demarz* 8561 (PERTH).

Distribution. Restricted to a few populations near Three Springs.

Habitat. Grows in gravelly loam in thick scrub.

Flowering period. July-August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One.

Etymology. Named from the Greek *oxys* (sharp) and the Latin *cedrus* (a cedar), this plant having pungent leaf lobes and a tall dense habit resembling a cedar.

Discussion. The tall, non-lignotuberous habit is very different from the low form of the two other varieties but the morphology otherwise is very similar except for having fewer, longer leaf lobes and slightly larger flowers.. It is sometimes sympatric with var. *fraseri*.

Ser. 5 *Acrodontae*

Dryandra ser. *Acrodontae* (Meisn.) A.S. George, stat. nov.

Dryandra § *Acrodontae* Meisn. in A.L.P.P. de Candolle, Prodr. 14: 479 (1856). Type: *D. carlinoides* Meisn., *lecto* (here chosen).

Small erect *shrubs*, with or without lignotuber. *Leaves* narrowly obovate-cuneate and sparsely serrate, or linear and pinnatifid; margins recurved or revolute. *Inflorescence* terminal or on short lateral branchet; involucral bracts shorter than flowers. *Perianth* straight; limb incurved before anthesis. *Pistil* curved, longer than perianth; pollen presenter small, narrow. *Old flowers* persistent. *Follicles* transversely elliptic to obovate, usually remaining closed until burnt. *Seed body* basal; wing notched.

A series of three species in the kwongan and shrublands north of Perth.

Typification. Meisner included two species in this taxon, both retained here. His diagnosis is appropriate to both, and *D. carlinoides* is selected as the first of the two in his treatment.

Dryandra kippistiana Meisn., in A.L.P.P. de Candolle, Prodr. 14: 473 (1856) - *Josephia kippistiana* (Meisn.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type:* south-western Western Australia, 184-, *J. Drummond* 4: 343 (*holo:* NY; *iso:* BM, CGE, K, MEL, PERTH).

There are two varieties.

1 Perianth 12-17 mm long; pistil 19-22 mm long; involucral bracts to 6-9 mm long; lignotuber absent ..... var. **kippistiana**

1: Perianth 18-20 mm long; pistil 24-25 mm long; involucral bracts to 10 mm long; lignotuber present ..... var. **paenepeccata**

Dryandra kippistiana Meisn. var. **kippistiana**

Shrub without lignotuber. Inner *involucral bracts* 6-9 mm long. *Perianth* 12-17 mm long. *Pistil* 19-22 mm long.

Distribution. Occurs from Eneabba south to Mogumber and New Norcia.

Habitat. Grows in sand, sand over laterite and in laterite, and near Mogumber on schistose hills, in kwongan.

Flowering period. August-October.

Dryandra kippistiana Meisn. var. **paenepeccata** A.S. George, var. nov.

Frutex lignotubero. Bracteae involucrales interiores ad 10 mm longae. Perianthium 18-20 mm longum. Pistillum 24-26 mm longum.

Typus: N of Coorow-Greenhead Rd along Willis Rd, Western Australia, 30°07'S, 115°30'E, 31 October 1986, *A.S. George* 16866 (*holo*: PERTH 04228898; *iso:* CANB, NSW).

Shrub with lignotuber. Inner *involucral bracts* to 10 mm long. *Perianth* 18-20 mm long. *Pistil* 24-26 mm long.

Selected collections examined. Mt Peron, *E.A. Griffin* 2451 (PERTH); Wongong, Oct. 1901, *Miss Lambert* (PERTH).

Distribution. Occurs in localities scattered over the range of the species, including Armadale and Wungong, south-east of Perth but now rare in that area.

Habitat. Grows in gravelly loam or sand over gravel in kwongan.

Flowering period. October-November.

Conservation status. Not endangered.

Etymology. Named from the Latin *paene* (almost) and *pecco, peccare* (to make a mistake). For some time during this research this taxon was thought to be related most closely to *D. sclerophylla*, and it was late in the revision before I realized that it should be placed with *D. kippistiana*.

Discussion. The leaves are usually straighter, more erect and more coarsely lobed than in var. *kippistiana*. Flowers later.

Ser. 6 *Capitellatae*

Dryandra ser. *Capitellatae* A.S. George, ser. nov.

Frutices effusae cum lignotubere. Folia pinnatifida marginibus revolutis. Inflorescentia in ramulo brevi ex ramo veteriore, interdum terminalis; bracteae involucrales quam flores breviores. Perianthium rectum; limbus antea anthesin incurvus. Pistillum rectum, incurvum vel recurvum; praebitor pollinis parce incrassatus, costatus. Flores veteres persistentes. Folliculi ellipsoidales, parvi, hirsuti. Semina ala parvissima.

Typus: *D. serratuloides* Meisn.

Sprawling *shrubs* with lignotuber. *Leaves* pinnatifid; margins revolute. *Inflorescence* on short branchlet from older stems, sometimes terminal; involucral bracts shorter than flowers. *Perianth* straight; limb incurved before anthesis. *Pistil* straight, incurved or outcurved; pollen presenter slightly thickened, ribbed. *Old flowers* persistent. *Follicles* ellipsoidal, small, hirsute. *Seed body* basal; wing very small.

A series of two species between Eneabba and Nyabing.

Etymology. Series name from the Latin *capitulum* (a head) with the diminutive suffix *-ella*, in reference to the small flower heads of the included species.

Dryandra serratuloides Meisn., Hooker's J. Bot. Kew Gard. Misc. 7: 123 (1855) - *Josephia serratuloides* (Meisn.) Kuntze, Revis. Gen. Pl. 2: 578 (1891) as *serratulodes*. *Type*: south-western Western Australia, 1850–51, *J. Drummond* 6: 213 (*iso:* B, BM, CGE, K (2 sheets), MEL, NSW, PERTH).

Occurs between Eneabba and Mogumber, represented by two subspecies.

1 Leaves with 6-12 lobes each side; innermost involucral bracts 11-20 mm long ..... subsp. **serratuloides**

1: Leaves with 20-33 lobes each side; innermost involucral bracts 22-25 mm long ..... subsp. **perissa**

Dryandra serratuloides Meisn. subsp. **serratuloides**

Leaves with 6-12 lobes each side, the lobes narrowly triangular-lanceolate. Innermost *involucral bracts* 11-12 mm long; floral bracts 3.5 mm long. *Perianth* 19-20 mm long; limb 4.5-5 mm long. *Pistil* 25-27 mm long, curved upwards and inwards; pollen presenter 3 mm long.

Selected collections examined. N of Mogumber, 21 September 1984, *C. Chapman* (PERTH); Gillingarra Nature Reserve, *S. Patrick* 675 (PERTH).

Distribution. Occurs around Gillingarra and Mogumber.

Habitat. Grows in loam over laterite, in clay-loam over laterite and in sandy gravel, in low kwongan or open scrub, sometimes with emergent *Eucalyptus wandoo.*

Flowering period. July-September.

Conservation status. Dept of Conservation & Land Management Conservation Code: Declared Rare.

Discussion. After anthesis the pistil is exserted centrifugally but then curves upwards and straightens below the pollen presenter, in contrast to *D. meganotia* in which it curves evenly outwards.

Dryandra serratuloides subsp. **perissa** A.S. George, subsp. nov.

Ab subsp. *serratuloide* foliis lobis 20-33 in quoque margine; bracteis involucralibus interioribus 22-25 mm longis, differt.

Typus: 11 km E of Brand Hwy on Tootbardi Road, Western Australia, 30°08'S, 115°29'E, 7 August 1986, *A.S. George* 16820 (*holo:* PERTH 04110587; *iso:* CANB, K, MEL).

Leaves to 19 cm long, 7-12 mm wide, with 20-33 narrowly triangular lobes each side, the sinuses 1.5-6 mm across. *Involucral bracts* ovate (outer) to lanceolate-oblong (inner), the margins and upper lamina silky-hirsute, the innermost 22-25 mm long; floral bracts oblong, slightly hairy, 2.8-3 mm long. *Perianth* 20-23 mm long, silky-hirsute but tip of limb glabrous; limb 5-6 mm long. *Pistil* 22-25 mm long; pollen presenter 3-3.8 mm long. *Follicles* obovate, thick, densely hirsute, 6 mm long.

Selected collections examined. Marchagee Track, *E.A. Griffin 3464* (NSW, PERTH); Alexander Morrison National Park, *S.J. Patrick 901B* (PERTH); Boothendarra Hill, *S.J. Patrick 1025* (PERTH).

Distribution. Occurs from Alexander Morrison National Park south to Badgingarra and Boothendarra Hill.

Habitat. Grows in lateritic gravelly loam, in mallee-kwongan with *Eucalyptus drummondii.*

Flowering period. August-September.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Three.

Etymology. Epithet from the Greek *perissos* (having more than the regular number), the subspecies having many more leaf lobes than subsp. *serratuloides*.

Discussion. Easily distinguished from subsp. *serratuloides* by the greater number of lobes to the leaves. The involucral bracts are longer and tend to be more hairy. The perianth is usually slightly longer than in subsp. *serratuloides* but the pistil is usually shorter.

Dryandra meganotia A.S. George, sp. nov.

Ab *D. serratuloide* Meisn. subsp. *serratuloide* lobis foliorum linearibus et bracteis involucralibus longioribus (17-20 mm longis) praecipue differt; et ab subsp. *perissa* A.S. George lobis foliorum paucioris (6-10 in quoque margine) pungentibus et bracteis involucralibus brevioribus, differt.

Typus: Dongolocking Nature Reserve, Western Australia, *c.* 33°03'S, 117°42'E, 14 October 1994, *A.S. George* 17247 (*holo:* PERTH 04228693; *iso:* CANB, K, MEL, NSW).

Shrub to 1 m. *Leaves* 3-7 cm long, 10-25 mm wide, the midrib usually curved; lobes 6-10 each side, at *c.* 80°-90°, linear, acute, pungent, the margins revolute. *Involucral bracts* ovate to lanceolate, obtuse, silky on margins, otherwise glabrous except a few short hairs towards apex outside, the innermost 17-20 mm long; floral bracts linear, 2.5 mm long, loosely hirsute. *Perianth* 22-23 mm long, densely silky; limb 5-6.2 mm long. *Pistil* 26-30 mm long, curved evenly outwards; pollen presenter 3-4 mm long. *Follicles* 5 mm long.

Selected collections examined. Reserve 16479, NW of Jitarning, *J.M. Browne* 003 (PERTH); *c.* 5 km NW of Nyabing, *K. Newbey* 3014 (PERTH); 7 km N of Harrismith, *E. Wittwer* 2039 (PERTH).

Distribution. Occurs in the Great Southern, from Kulin to Nyabing.

Habitat. Grows in clay-loam or sandy loam over gravel, in kwongan, sometimes with Wandoo.

Flowering period. October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Three.

Etymology. Named from the Greek *megas* (large) and *notios* (southern), this species occurring in the region of south-western Western Australia known as the Great Southern.

Discussion. The flowers are a brighter yellow than those of *D. serratuloides* subsp. *perissa* (subsp. *serrratuloides* has pinkish flowers). Sometimes resembles *D. cirsioides* and *D. xylothemelia* but may be distinguished especially by the smaller flowers and fruit.

Ser. 7 *Ilicinae*

Dryandra ser. *Ilicinae* (Meisn.) A.S. George, stat. nov.

Dryandra § *Ilicinae* Meisn. in A.L.P.P. de Candolle, Prodr. 14: 467 (1856). *Type*: *D. praemorsa* Meisn., *lecto* (here chosen).

Mostly erect *shrubs* or small *trees*, without lignotuber. *Leaves* cuneate, serrate. *Inflorescence* terminal or on short lateral branchlet, large, conspicuous; involucral bracts shorter than flowers. *Perianth* straight. *Pistil* curved, prominently exserted adaxially before anthesis, longer than perianth; pollen presenter narrow, ribbed. *Old flowers* soon falling. *Follicles* obovate, loosely attached, usually opening when mature. *Seed body* basal; wing large, notched.

A series of 3 species occurring between Perth and Hopetoun.

Typification. Meisner included four species in § *Ilicinae.* Of these, *D. cuneata* is here placed in ser. *Armatae* and *D. floribunda* (=*D. sessilis*) in ser *Floribundae*. His brief diagnosis applies equally well to the other two - *D. praemorsa* and *D. quercifolia* - and the former is selected as lectotype as the first listed by Meisner.

Dryandra praemorsa Meisn., in J.G.C. Lehmann, Pl. Preiss. 2: 265 (1848) - *Josephia praemorsa* (Meisn.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: south-western Western Australia, 184-, *J. Drummond* 2: 339 (*iso:* K).

There are two varieties.

1 Pistil 30-38 mm long; leaves usually 2.5-6 cm long, 1-4 cm wide ..... var. **praemorsa**

1: Pistil 47-52 mm long; leaves usually 4-11 cm long, 2.5-6 cm wide ..... var. **splendens**

Dryandra praemorsa Meisn. var. **praemorsa**

Dryandra praemorsa var. *elongata* Meisn., in A.L.P.P. de Candolle, Prodr. 14: 467 (1856). *Type*: south-western Western Australia, 184-, *J. Drummond* 5: 422 (*iso:* BM, K (2 sheets), MEL, NY).

Leaves 2.5-6 cm long, 1-4 cm wide. *Pistil* 30-38 mm long; pollen presenter 2-2.5 mm long.

Distribution. Occurs between Clackline and Dwellingup.

Habitat. Grows in lateritic in Jarrah-Marri forest and by granitic slopes.

Flowering period. September-October.

Selected collections examined. Mt Randall, 31 July 1932, *C.A. Gardner s.n.* (PERTH); Serpentine Falls, 25 Aug. 1941, *C.A. Gardner s.n.* (PERTH); NW of Dwellingup, *A.S. George* 17181 (PERTH); Clackline, Nov. 1939, *B.T. Goadby* (PERTH).

Conservation status. Currently not endangered but vulnerable to *Phytophthora* and to frequent burning (most populations are in State forest which is control-burned).

Discussion. Some collections are intermediate between the two subspecies (see below).

Dryandra praemorsa var. **splendens** A.S. George, var. nov.

Ab var. *praemorsa* foliis et pistillo majore differt. Folia 4-11 cm longa, 2.5-6 cm lata. Pistillum 47-52 mm longum; praebitor pollinis 4-5 mm longus.

Typus: *c.* 10 km E of Albany Hwy on road from North Bannister to Wandering, Western Australia, *c.* 32°35'S, 116°31'E, 14 October 1994, *A.S. George* 17251 (*holo:* PERTH 04228863; *iso:* CANB, K, NSW, PERTH 04228871).

Leaves 4-11 cm long, 2.5-6 cm wide. *Pistil* 47-52 mm long; pollen presenter 4-5 mm long.

Selected collections examined. *c.* 60 km SSE of Perth on Albany Hwy, Sept. 1925, *C.A. Gardner s.n.* (PERTH); Bannister River, Nov. 1962, *F. Lullfitz* (PERTH).

Distribution. Occurs from the Brookton Hwy south to Bannister.

Habitat. Grows in lateritic gravel, in Jarrah-Marri open forest.

Flowering period. September-October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Three. The populations are vulnerable to *Phytophthora*.

Etymology. The Latin epithet refers to the large conflorescence.

Discussion. The leaf teeth are usually coarser than in var. *praemorsa*. There are two intermediate collections: Beraking, 1934, *coll. unknown* (PERTH) has leaves 4-9.5 cm long and 2.5-4 cm wide; pistil 37-40 mm long; Bannister River, Nov. 1962, *F. Lullfitz* (PERTH), has pistils 44-45 mm long.

Dryandra anatona A.S. George, sp. nov.

Frutex angustus ad 5 m altus, caule principali uno et ramulis lateralibus brevibus, sine lignotubero. Caulis tomentosus hirsutusque. Folia cuneata, obtusa ad acuta, marginibus recurvis irregulariter serratis; lamina 3-7 cm longa, 12-22 mm lata, supra hirsuta sed glabrescens, infra albo-tomentosa. Inflorescentia terminalis vel in ramulo laterali; bracteae involucrales lineari-lanceolatae, acutae ad acuminatae, pubescentes marginibus hirsutis, exteriores squarrosae, interiores 20-25 mm longae; flores *c.* 170 per capitulum. Perianthium 39-40 mm longum, supra basin hirsutum, deinde pubescens, limbo 5.5-6 mm longo hirsuto. Pistillum 49-50 mm longum, glabrum; praebitor pollinis angustus, costatus, 2-3 mm longus. Folliculi obovoidei, pubescentes, 23-24 mm longi.

Typus: SSE of Mt Magog, Stirling Range National Park, Western Australia, 34°26'S, 117°57'E, 5 November 1986, *A.S. George* 16886 (*holo:* PERTH 04228707; *iso:* CANB).

Shrub to 5 m with 1 main stem and short laterals, without lignotuber. *Stems* tomentose and hirsute. *Leaves* cuneate, obtuse to acute, irregularly serrate, mucronate, undulate; lamina 3-7 cm long, 12-22 mm wide, hirsute and glabrescent above, white-tomentose below; margins recurved; teeth

10-12 each side; petiole 3-7 mm long, hirsute. *Inflorescence* terminal or on short lateral branchlet; receptacle T-shaped; involucral bracts linear-lanceolate, acute to acuminate, the outer ones squarrose, pubescent with hirsute margins, the innermost 20-25 mm long; flowers *c.* 170 per head. *Perianth* 39-40 mm long, hirsute above base, then pubescent; limb 5.5–6 mm long, acute, hirsute, the apical hairs coarser. *Pistil* 49-50 mm long, glabrous; ovary long-hirsute; pollen presenter narrow above slender neck, ribbed, 2-3 mm long. *Follicles* obovoid, pubescent, 23-24 mm long, hirsute.

Selected collections examined. Moongoongoonderup Hill, Stirling Range, *B. Barnsley* 735 (CANB, PERTH); Stirling Range Drive, *A. Cochrane* 368 (PERTH).

Distribution. Known from a single locality in the Stirling Range National Park.

Habitat. Grows on slopes in sandy soil over gravelly shale, in thick kwongan.

Flowering period. January.

Conservation status. Dept of Conservation & Land Management Conservation Code: Declared Rare. The only known population is infected by *Phytophthora* and has been reduced to a few plants. Unless urgent conservation action is taken it will be extinct within one or two years.

Etymology. Epithet from the Greek *tonos* (a drawing out or stretching) with the prefix *ana-* (upwards), in reference to the tall, spindly habit.

Discussion. This species is remarkable for the tall, spindly habit and large follicles. It is placed in ser. *Ilicinae* in which it is allied to *D. praemorsa* but has a very spindly habit, narrower leaves with smaller lobing and much larger follicles. Superficially it also resembles *D. falcata* but is more hairy, with long (15–17 mm) floral bracts and a very different fruit. The juvenile leaves are obovate to cuneate and shortly serrate.

Ser. 8 *Dryandra*

Dryandra R. Br. ser. *Dryandra* - *Dryandra* ser. *Formosae* Benth., Fl. Austral. 5: 564, 572 (1870). *Type*: *D. formosa* R. Br.

?*Josephia* § *Dryandra* Kuntze, in T.E. von Post & C.E.O. Kuntze, Lex. Gen. Phan. 299 (1903) as *Dryandera*. *Type*: none cited.

Erect *shrubs* without lignotuber. *Leaves* broadly linear, pinnatifid. *Inflorescence* terminal or on short lateral branchlet, conspicuous; involucral bracts broad, shorter than flowers. *Perianth* straight, the limb inflexed before anthesis. *Pistil* stout, curved, longer than perianth; pollen presenter narrow, finely ribbed. *Old flowers* soon falling. *Follicles* several, obovate, often opening when mature, usually firmly attached. *Seed* wing terminal, notched.

A series of 3 species occurring between Eneabba and Albany.

Dryandra nobilis Lindl., Sketch Veg. Swan R. xxxiii (1840) - *Josephia nobilis* (Lindl.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: south-western Western Australia, 183-, *J. Drummond s.n.* (*neo* (here nominated): K).

Typification. Unusually for the many species described by Lindley in this work, there is no type at CGE. The neotype is from one of Drummond's early, unnumbered collections and may well be a duplicate of material seen by Lindley.

There are two subspecies.

1 Leaf lobes usually 14-24 each side; lamina 8-25 mm wide; sinuses 6-15 mm across; flowers not scented; perianth golden including limb ..... subsp. **nobilis**

1: Leaf lobes usually 20-30 each side; lamina 5-9 mm wide; sinuses 3-7 mm across; flowers strongly and sweetly scented; perianth red-pink with greenish limb ..... subsp. **fragrans**

Dryandra nobilis Lindl. subsp. **nobilis**

Leaf lobes mostly 14-24 each side; lamina 8-25 mm wide; sinuses 6-15 mm across. *Flowers* not scented. *Perianth* golden including limb.

Distribution. Occurs between Walebing and Katanning.

Habitat. Grows on lateritic rises in eucalypt woodland and tall shrubland.

Flowering period. July-October.

Dryandra nobilis subsp. **fragrans** A.S. George, subsp. nov.

Foliorum lobi plerumque 20-30 in quoque margine; lamina 5-9 mm lata, sinubus 3-7 mm latis. Flores iucunde odorati; perianthium roseum limbo virenti.

Typus: Willis Rd, N of Coorow-Greenhead Rd, Western Australia, 29°59'S, 115°32'E, 5 August 1986, *A.S. George* 16786 (*holo:* PERTH 04228421; *iso:* CANB, K, NSW).

Leaf lobes mostly 20-30 each side; lamina 5-9 mm wide; sinuses 3-7 mm across. *Flowers* strongly and sweetly scented. *Perianth* red-pink with greenish limb.

Selected collections examined. c. 24 km NW of Badgingarra, *A.S. George* 6769 (PERTH); 14.5 km N of Badgingarra, on Brand Hwy, *A.S. George* 16824 (PERTH).

Distribution. Occurs between Eneabba and Badgingarra.

Habitat. Grows on lateritic rises, in thick kwongan.

Flowering period. July-September.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Three.

Etymology. The Latin epithet *fragrans* (pleasantly scented) refers to the flowers.

Discussion. Differs from subsp. *nobilis* in having narrower leaves with usually smaller lobes, in the scented flowers and in the perianth being reddish pink with a green limb.

Ser. 9 *Foliosae*

Dryandra ser. *Foliosae* A.S. George, ser. nov.

Frutices plerumque rectae, sine lignotubero. Folia conferta, linearia, pinnatifida. Inflorescentia plerumque in ramulo brevi laterali, occulta, raro terminalis; bracteae involucrales flores *c.* aequilongae vel parum breviores; receptaculum planum. Perianthium rectum ad leniter curvatum, limbo ante anthesin inflexo. Pistillum curvatum, perianthio longiore; praebitor pollinis angustus, costatus. Flores veteres persistentes. Folliculi magni, curvato-obovati, valde affixi.

Typus: *D. mucronulata* R. Br.

Mostly erect *shrubs*, without lignotuber. *Leaves* crowded, linear, pinnatifid. *Inflorescence* usually on short lateral branchlet from old stem, concealed, occasionally terminal; involucral bracts c. as long as or slightly shorter than flowers; receptacle flat. *Perianth* straight to gently curved, the limb inflexed before anthesis. *Pistil* curved, longer than perianth; pollen presenter narrow, ribbed. *Old flowers* persistent. *Follicles* large, curved-obovate, usually remaining closed until burnt, firmly attached.

A series of 3 species of shrublands and kwongan between Busselton and Ravensthorpe.

Etymology. The epithet, from the Latin *folium* (a leaf) and the suffix *-osus* (indicating abundance), refers to the densely leafy habit of the 3 species in the series.

Dryandra mucronulata R. Br., Trans. Linn. Soc. London 10: 213 (1810) - *Josephia mucronulata* (R. Br.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: between Princess Royal Harbour and [West] Cape Howe, [Western Australia], December 1801, *R. Brown* Iter Australiense 3420 (*holo:* BM; *iso:* K, MEL, PERTH).

Discussion. Distinguished from the closely related *D. baxteri* by the broad, abruptly acuminate silky involucral bracts, the smaller flowers and the slightly thickened, ribbed pollen presenter.

There are 2 subspecies.

1 Leaves 5-12 mm wide; sinuses V-shaped; teeth of leaves subtending inflorescence straight; perianth 15-20 mm long; pistil 20-25 mm long .... subsp. **mucronulata**

1: Leaves 4-7 mm wide; sinuses ± U-shaped; teeth of leaves subtending inflorescence often retrorse; perianth 27-30 mm long; pistil 34-38 mm long ... subsp. **retrorsa**

Dryandra mucronulata R. Br. subsp. **mucronulata**

Leaves 5-12 mm wide; teeth of leaves subtending inflorescence straight; sinuses V-shaped, 3-6 mm across. *Perianth* 15-20 mm long; limb 3 mm long. *Pistil* 20-25 mm long; pollen presenter 1.5 mm long.

Selected collections examined. Mt Toolbrunup, *A.S. George* 10873 (PERTH); near junction of Salt River Rd and Red Gum Pass Rd, *A.S. George* 16656 (PERTH); North Point, Two Peoples Bay, *A.S. George* 6281 (PERTH); 60 km NE of Albany on Hassell Hwy, *D.J.E.Whibley* 5233 (PERTH).

Distribution. Occurs in the western and central parts of the Stirling Range National Park and south to Albany and Cheyne Beach.

Habitat. In the Stirling Range grows in gravelly loam in mallee kwongan and in rocky shale in tall shrubland, elsewhere in sand in kwongan.

Flowering period. May-July.

Dryandra mucronulata R. Br. subsp. **retrorsa** A.S. George, subsp. nov.

Ab subsp. *mucronulata* foliis 4-7 mm latis; dentibus foliorum inflorescentiae cingentium plerumque retrorsis; sinubus U-formis, 2-5 mm latis; perianthio 27-30 mm longo, limbo 3.5-4 mm longo; pistillo 34-38 mm longo, et praebitore pollinis 2 mm longo, differt.

Typus: SW of Cranbrook, Western Australia, 34°16'S, 116°59'E, 20 May. 1995, *A.S. George* 17254 (*holo*: PERTH 04228499; *iso:* CANB, K, MEL, NSW, PERTH 04228502).

Leaves 4-7 mm wide; teeth of leaves subtending inflorescence often retrorse; sinuses ± U-shaped, 2-5 mm across. *Perianth* 27-30 mm long; limb 3.5-4 mm long. *Pistil* 34-38 mm long; pollen presenter 2 mm long.

Selected collections examined. NW of Cranbrook, *A.S. George* 9492 (PERTH); SW of Broomehill, 25 July 1963, *K. Newbey* 709D (PERTH).

Distribution. Near Cranbrook and Broomehill.

Habitat. Grows in clay in *Eucalyptus wandoo* woodland and in laterite in tall scrub.

Flowering period. July-August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One. The only known extant population (of about ten plants) is on a narrow road verge. The species appears to have died out at the other locality near Cranbrook, and that near Broomehill is probably now cleared.

Etymology. The epithet is from the Latin *retrorsus* (turned backwards), in reference to the teeth and lobes of the floral leaves.

Discussion. Flowers larger than those of subsp. *mucronulata*, leaves narrower with scalloped margins.

Ser. 10 *Decurrentes*

Dryandra ser. *Decurrentes* (Meisn.) A.S. George, stat. nov.

Dryandra § *Decurrentes* Meisn. in A.L.P.P. de Candolle, Prodr. 14: 476 (1856). *Type*: *D. comosa* Meisn., *lecto* (here chosen).

Bushy *shrubs* without lignotuber. *Leaves* linear, sparsely serrate. *Inflorescence* sessile or on short branchlet, on older stem; involucral bracts as long as or exceeding flowers. *Perianth* straight, the limb often inflexed before anthesis. *Pistil* curved, longer than perianth; pollen presenter small, narrow. *Old flowers* persistent. *Follicles* obovate, usually remaining closed until burnt, fairly firmly attached.

A single species confined to the Wongan Hills district.

Typification. Meisner included eleven species in this group, here considered to belong to seven series. All except *D. tenuifolia* and *D. comosa* can be placed in previously named series. Of these two species, the latter has a slight edge in matching the protologue in having leaves always with widely spaced lobes that are more prominently decurrent than in *D. tenuifolia* (Meisner described them as 'lobis plus minus remotis brevibus . . . decurrenti-confluentibus').

Ser. 11 *Tenuifoliae*

Dryandra ser. *Tenuifoliae* A.S. George, ser. nov.

Frutices recti vel prostrati sine lignotubero. Folia linearia, breviter pinnatifida, serrata vel integra; petiolus gracillimus. Inflorescentia in ramulo brevi laterali inter folia veteria. Perianthium rectum limbo recto. Pistillum rectum vel leviter curvatum, perianthio breviore; praebitor pollinis non incrassatus, costatus. Flores veteres persistentes. Folliculi obovati, glabri, leniter affixi.

Typus: *D. tenuifolia* R. Br.

Erect or prostrate *shubs* without lignotuber. *Leaves* linear, shortly pinnatifid, serrate or entire; petiole very slender. *Inflorescence* on short lateral branchlet among older foliage. *Perianth* straight, the limb erect. *Pistil* straight or gently curved, shorter than perianth; pollen presenter not thickened, ribbed. *Old flowers* persistent. *Follicles* obovate, glabrous, loosely attached.

Two species widespread between Arthur River and Israelite Bay. Differs from ser. *Decurrentes* in having the pistil shorter than the perianth, and from ser. *Runcinatae* in the non-succulent perianth. The petiole of *D. tenuifolia* is remarkably slender, 0.1-0.2 mm wide.

Dryandra tenuifolia R. Br., Trans. Linn. Soc. London 10: 215 (1810) - *Josephia tenuifolia* (R. Br.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: Bay I [Lucky Bay, E of Esperance, Western Australia], January 1802, *R. Brown* Iter Australiense 3425 (*holo*: BM; *iso:* K (2 sheets), MEL).

Distribution. Widespread in southern Western Australia from near Darkan and the Beaufort River (south of Williams) to Cape Arid, east of Esperance.

There are two varieties.

1 Plant bushy, ± erect; leaves pinnatifid to serrate for all or most of their length ..... var. **tenuifolia**

1: Plant prostrate or procumbent; leaves entire or serrate only in upper part ..... var. **reptans**

Dryandra tenuifolia R. Br. var. **tenuifolia**

D. elegans Meisn., in A.L.P.P. de Candolle, Prodr. 14: 473 (1856) - *D. tenuifolia* var. *elegans* (Meisn.) Benth., Fl. Austral. 5: 582 (1870). *Type*: south-western Western Australia, 184-, *J. Drummond* 4: 317 (*holo:* NY; *iso:* BM, CGE, K (2 sheets), MEL).

Shrub bushy, the branches erect or spreading, to 1 m tall. *Leaves* pinnatifid or serrate for most of their length.

Distribution. Occurs from Kamballup to Cape Arid, including parts of the Stirling Range.

Habitat. Grows in sand over gravel, clay-loam and gravel, in kwongan, often with emergent mallees.

Flowering period. March-June.

Conservation status. Not endangered.

Discussion. Some collections are intermediate between the varieties.

Dryandra tenuifolia R. Br. var. **reptans** A.S. George, var. nov.

Frutex prostratus vel procumbens. Folia integra vel non nisi ad apicem serrata.

Typus: *c.* 54 km S of Williams, Western Australia, 28 July 1953, *R. Melville* 4359 *& R. D. Royce* (*holo:* PERTH 01791567; *iso:* HO, K, MEL).

Shrub prostrate or procumbent. *Leaves* entire, or serrate only in upper part.

Selected collections examined. Toompup Rd, 6.1 km S of Gnowangerup-Ongerup rd, Western Australia, 34°03'S, 118°27'E, 29 July 1986, *A.S. George* 16676 (PERTH); *c.* 16 km E of Ongerup, *K. Newbey* 881 (PERTH); *c.* 28 km W of Ravensthorpe and 12 km N of the Ravensthorpe-Ongerup road, *P.G. Wilson* 7130 (PERTH).

Distribution. Occurs from near Darkan and the Beaufort River to Jerramungup, with an outlier farther east towards Ravensthorpe.

Habitat. Grows in sand over clay or laterite, in kwongan with emergent mallees.

Flowering period. July.

Conservation status. Not endangered.

Etymology. The Latin epithet *reptans* (creeping) refers to the habit.

Discussion. Illustrated in R.M. Sainsbury, Field Guide Dryandra 107 (1985) as *D. tenuifolia.*

Dryandra obtusa R. Br., Trans. Linn. Soc. London 10: 214 (1810) - *Josephia obtusa* (R. Br.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: Lucky Bay, [E of Esperance, Western Australia], January 1802, *R. Brown* Iter Australiense 3422 (*holo:* BM; *iso:* K).

Dryandra multiserialis F. Muell., Fragm. 5: 185 (1866). *Type*: near Cape le Grand, Western Australia, *G. Maxwell*; *lecto* (here chosen): MEL.

Typification. I have found no sheet annotated by Mueller as *D. multiserialis*. The above collection agrees with the protologue and is probably the specimen seen by him.

Discussion. Dryandra obtusa is placed tentatively in ser. *Tenuifoliae* but requires further research to determine if this is the appropriate series. It resembles species of ser. *Runcinatae* but the perianth is not succulent at the base.

Ser. 12 *Runcinatae*

Dryandra ser. *Runcinatae* (Meisn.) A.S. George, stat. nov.

Dryandra § *Runcinatae* Meisn. in A.L.P.P. de Candolle, Prodr. 14: 468 (1856). *Type*: *D. runcinata* Meisn. = *D. ferruginea* Kippist ex Meisn.

Small erect or prostrate *shrubs*, with or without lignotuber. *Leaves* large, pinnatifid to serrate. *Inflorescence* terminal or axillary, often on older stem, sessile or on short branchlet; involucral bracts as long as or longer than flowers, usually broadly linear, red-brown and often shining; receptacle flat or gently concave or very convex. *Perianth* straight, swollen and succulent for a short distance above base; limb large, erect. *Pistil* curved, longer than perianth; pollen presenter narrow, ribbed. *Old flowers* persistent. *Follicles* obovate with notch above base, shining, usually remaining closed until burnt.

A series of 4 species in southern Western Australia. The large leaves, large heads with prominent brown bracts and perianth with succulent, swollen lower claws characterize this series.

Dryandra ferruginea Kippist ex Meisn., Hooker's J. Bot. Kew Gard. Misc. 7: 123 (1855) - *D. proteoides* Lindl. var. *ferruginea* (Kippist ex Meisn.) Benth., Fl. Austral. 5: 582 (1870). *Type*: south-western Western Australia, 184-, *J. Drummond* 5: 416 (*iso:* BM, CGE, K (2 sheets)).

A variable species here divided into 6 subspecies.

1 Stems erect
2 Leaf lobes at 80°-90°
3 Pistil 50-66 mm long; involucral bracts 50-60 mm long (SE of Pingelly) ..... subsp. **tutanningensis**
3: Pistil 30-45, rarely to 50 mm long; involucral bracts 30-50 mm long, rarely longer
4 Leaf lamina 15-35 cm long, 10-28 (rarely to 40 mm) mm wide; margins revolute (Wickepin to Nyabing & Lake Grace) ..... subsp. **ferruginea**

4: Leaf lamina 8-15 cm long, 18-35 mm wide; margins almost flat (Stirling Range) ..... subsp. **pumila**

2: Leaf lobes ascending at 60°-70° (Corrigin area) ..... subsp. **obliquiloba**

1: Stems prostrate

5 Leaves 20-45 mm wide, the lobes usually falcate to somewhat reflexed (Newdegate-Ravensthorpe) ..... subsp. **chelomacarpa**

5: Leaves 7-15 mm wide, the lobes triangular, at *c.* 90° (E of Lake King) ..... subsp. **flavescens**

Dryandra ferruginea Kippist ex Meisn. subsp. **ferruginea**

D. runcinata Meisn., in A.L.P.P. de Candolle, Prodr. 14: 469 (1856) - *Josephia runcinata* (Meisn.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: south-western Western Australia, 184-, *J. Drummond* 4: 318 (*iso:* BM, K (2 sheets), MEL, PERTH).

Erect bushy *shrub* to 70 cm without lignotuber. *Leaf* lamina 15-35 cm long, 10-28 (rarely to 40) mm wide; lobes 5-10 each side, at 80°-90°, triangular, acute, the margins moderately recurved; petiole 5-15 cm long. *Involucral bracts* 38-50 mm long; floral bracts 8-11 mm long. *Perianth* 35-40 (rarely to 50) mm long. *Pistil* 38-43 (rarely to 48) mm long.

Distribution. Occurs from Wickepin and Kulin to Nyabing and east to Lake Grace.

Habitat. Grows in sandy loam over lateritic gravel in kwongan.

Flowering period. September-October.

Conservation status. Not endangered.

Discussion. Very variable in size of heads and flowers and in indumentum of involucral bracts, some specimens being quite hairy, others almost glabrous except tips and margins. *Newbey* 3044, 1 km west of Tarin Rock (PERTH), has leaves with few or no leaf lobes but is otherwise typical.

Dryandra ferruginea subsp. **tutanningensis** A.S. George, subsp. nov.

Ab subspeciebus aliis foliis magnis (lamina 15-35 cm longa) serratis et capitulis magnis (bracteae involucrales 50-66 mm longae; pistillum 50-66 mm longum), praecipue differt.

Typus: Tutanning Nature Reserve, SE of Pingelly, Western Australia, 7 October 1973, *A.S. George* 11713 (*holo:* PERTH 03462439; *iso:* CANB, K, NSW).

Bushy erect *shrub* to 1 m. *Leaf* lamina 15-35 cm long, 15-27 mm wide; lobes 15-20 each side, triangular to broadly so, acute, at 80°-90° but lower margin at more acute angle than upper; sinuses obliquely U-shaped, 5-20 mm across; margins shortly recurved; petiole 3-10 cm long. *Involucral bracts* 50-66 mm long; floral bracts 9-10 mm long. *Perianth* 45-50 mm long; limb 14-15 mm long. *Pistil* 50-66 mm long; pollen presenter 8-9 mm long.

Selected collections examined. Tutanning Reserve, *G. Heinsohn* 25 (PERTH); Tutanning Reserve, *B.G. Muir* 37 (PERTH).

Distribution. Restricted to Tutanning Nature Reserve, south-east of Pingelly.

Habitat. Grows in massive laterite with *Eucalyptus accedens* and thick scrub.

Flowering period. October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. Named after the Tutanning Nature Reserve to which the subspecies is confined, the suffix *-ensis* indicating place.

Discussion. Distinguished by the large leaves and inflorescence. Leaf lobes more numerous and wider and with less recurved margins than in subsp. *ferruginea.* Three collections (e.g. *A.S. George* 16699, north of Nyabing, PERTH) have large heads and flowers as in subsp. *tutanningensis* but leaves of subsp. *ferruginea*; these populations require further study.

Dryandra ferruginea subsp. **pumila** A.S. George, subsp. nov.

Ab subspeciebus aliis habitu minore (ad 30 cm alto) et foliis brevioribus (lamina 8-15 cm longa) praecipue differt.

Typus: scenic lookout between Mt Talyuberlup and Mt Magog picnic sites, Stirling Range Scenic Drive, Western Australia, 28 September 1986, *K. Alcock* 472 (*holo:* PERTH 04110595; *iso:* CANB).

Erect *shrub* to 30 cm tall without lignotuber. *Leaf* lamina 8-15 cm long, 18-35 mm wide, 12-30 mm wide; lobes 8-12 each side, at *c.* 70°-80°, triangular, acute; margins almost flat; sinuses 5-15 mm across; petiole 3-5 cm long. *Follicles* broadly obovate with slight basal notch, 15 mm long.

Selected collections examined. North-west slope of Little Mondurup, *G.J. Keighery* 9190 (PERTH).

Distribution. Endemic in the Stirling Range National Park, known from two populations.

Habitat. Grows on rocky shale slopes in low open kwongan and mallee kwongan.

Flowering period. September-October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One. Known from two populations susceptible to infection by *Phytophthora.*

Etymology. Named from the Latin *pumilus* (small, diminutive), this subspecies being of much smaller habit than the others.

Discussion. Essentially smaller in habit than subsp. *ferruginea*, the leaves shorter, usually with narrower sinuses and the margins less recurved.

Dryandra ferruginea subsp. **obliquiloba** A.S. George, subsp. nov.

Ab subspeciebus aliis foliis lobis obliquis longioribus angustioribus differt.

Typus: reserve by Scenic Lookout, *c.* 2 km W of Corrigin, Western Australia, *c.* 32°50'S, 117°51'E, 8 October 1994, *A.S. George* 17224 (*holo:* PERTH 04228715; *iso:* AD, BRI, CANB, K, MEL, NSW, PERTH 04228723).

Bushy *shrub* to 1 m without lignotuber. *Leaf* lamina pinnatipartite, 10-30 cm long, 20-40 mm wide; lobes 10-17 each side, at 60°-70°, linear–narrowly triangular, acute; margins scarcely recurved; sinuses obliquely U-shaped, 10-30 mm across; petiole 10-15 cm long. *Involucral bracts* 40-45 mm long; flowers *c.* 90-115 per head; floral bracts 4-5 mm long. *Perianth* 30-34 mm long; limb 8-9.5 mm long. *Pistil* 35-42 mm long; pollen presenter 5-7 mm long. *Follicles* broadly obovate, 13-14 mm long.

Selected collections examined. 1.5 km E of Dudinin on Kulin Rd, *K. Alcock* 484 (MEL); *c.* 4 km W of Corrigin, *R. Spjut et al.* 7362 (PERTH); Middleton Rd, S of Corrigin, *A.S. George* 17228 (AD, BRI, PERTH).

Distribution. Occurs in the Corrigin area.

Habitat. Grows in lateritic gravel in dense kwongan.

Flowering period. September-October.

Conservation status. Not endangered.

Etymology. Named from the Latin *obliquus* (oblique, slanting) and *lobus* (a lobe), in reference to the leaf lobes.

Discussion. Typically has longer, narrower leaf lobes than the other subspecies.

Dryandra ferruginea subsp. **chelomacarpa** A.S. George, subsp. nov.

Ab subspp. *ferruginea*, *tutanningense* A.S. George et *pumila* A.S. George caulibus prostratis praecipue differt; ab subsp. *flavescenti* lobis foliorum longiore (lamina folii 20-45 mm lata), marginibus breviter recurvis, differt.

Typus: Creek Rd, off Old Ravensthorpe [-Newdegate] Rd, Western Australia, 31 July 1986, *A.S. George* 16714 (*holo:* PERTH 03462544; *iso:* CANB, NSW).

Shrub with underground prostrate stems, to 1 m diam., with ?lignotuber. *Leaves* pinnatipartite; lamina 15-20 cm long, 20-45 mm wide; margins shortly recurved; lobes 10-15 each side, narrowly triangular–falcate, at 80°-90°, acute, pungent; sinuses U-shaped 8-25 mm across; petiole 3-6 cm long. *Involucral bracts* 30-40 mm long; flowers 40-65 per head; floral bracts 7 mm long. *Perianth* 32-35 mm long, yellow; limb 9-11 mm long. *Pistil* 35-45 mm long; pollen presenter 4-8 mm long. *Follicles* obovate with prominent basal notch, 15 mm long.

Selected collections examined. c. 16 km W of Lake King, *K. Newbey* 1839 (PERTH); S of Newdegate, *M. Pieroni* 11 (MEL, PERTH).

Distribution. Occurs between Newdegate and Ravensthorpe.

Habitat. Grows in sandy loam over gravel in low kwongan.

Flowering period. July-September.

Conservation status. Not endangered.

Etymology. Named from the Greek *cheloma* (a notch) and *carpos* (a fruit), in reference to the notch at the base of the follicle.

Discussion. Distinguished by the prostrate stems; leaf lobes much longer than in subsp. *flavescens.*

Dryandra ferruginea subsp. **flavescens** A.S. George, sp. nov.

Ab subsp. *chelomacarpa* A.S. George foliorum lobis brevioribus (lamina folii 7-15 mm lata) marginibus arcte revolutis, differt. Folia in sicco flavescentia.

Typus: E of Lake King crossroads, Western Australia, 31 July 1986, *A.S. George* 16727 (*holo:* PERTH 03462498; *iso:* CANB, PERTH 03462501, 03462528).

Shrub with prostrate stems, sometimes underground, to 1 m diam., with ?lignotuber. *Leaves* pinnatifid; lamina 12-30 cm long, 7-15 mm wide, sometimes to 25 mm; teeth 5-20 each side, triangular, acute, pungent, at c. 90°; margins strongly revolute; sinuses 8-15 mm across; petiole 3-6 mm long. *Involucral bracts* 4.5-5.5 cm long; flowers c. 75 per head; floral bracts 5-9 mm long. *Perianth* 31-40 mm long, pale yellow, cream at base; limb 7-8.5 mm long, sparsely hirsute to almost glabrous, greenish. *Pistil* 43-50 mm long; pollen presenter 4.5-6 mm long. *Follicles* obovate with prominent basal notch, 15 mm long.

Selected collection examined. Frank Hann National Park, *D. Monk* 309 (PERTH).

Distribution. Occurs to the east of Lake King, including the western part of Frank Hann National Park, and north to Forrestania.

Habitat. Grows in sandy loam with some gravel, in low kwongan.

Flowering period. August.

Conservation status. Not endangered.

Etymology. The Latin *flavescens* (becoming yellow) refers to the leaves which dry a yellowish colour.

Discussion. Leaves drying yellowish, with much smaller lobes than in subsp. *chelomacarpa.*

Dryandra corvijuga A.S. George, sp. nov.

Ad *D. ferrugineam* Meisn. affinis, a qua habitu recto altiore (ad 1.3 m alto), et foliis confertis breviter serratis (lamina folii 5-13 mm lata), differt.

Typus: Mt Short, N of Ravensthorpe, Western Australia, 2 October 1986, *K. Alcock* 494 (*holo:* PERTH 04225791; *iso:* CANB).

Shrub to 1.3 m, without lignotuber, densely leaved. *Leaves* broadly linear, acute, serrate; lamina 10-20 cm long, 5-13 mm wide; teeth 10-25 each side, triangular, oblique, acute, pungent; margins revolute; petiole slender, 2-6 cm long. *Inflorescence* on short lateral branchlet; involucral bracts 4-6 cm long, obtuse, appressed-pubescent, shining brown; flowers *c.* 60 per head. *Perianth* 38-41 mm long, shortly hirsute above base, then glabrous; limb 7-9 mm long, loosely hirsute. *Pistil* 44-46 mm long, glabrous; pollen presenter narrow, 5-6 mm long, ribbed. *Follicles* elliptic-obovate, 15 mm long, glabrous.

Selected collections examined. Mt Short, Sept. 1980, *E.M. Bennett* (PERTH); Elverdton, SE of Ravensthorpe, *A.S. George* 1641 (PERTH).

Distribution. Occurs in the Ravensthorpe Range.

Habitat. Grows in rocky, lateritic soil in dense shrubland.

Flowering period. September.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The epithet is from the Latin *corvus* (a crow or raven) and *jugus* (paired or yoked together and hence *jugum*, a range of hills), in reference to the Ravensthorpe Range.

Discussion. Distinguished by the erect, densely leaved habit and shortly serrate leaves.

Dryandra epimicta A.S. George, sp. nov.

Species bene distincta. Frutex cum lignotubero caulibus prostratis. Folia conferta, linearia, pinnatifida, lamina 11-33 cm longa, 7-14 mm lata; margines revoluti; lobi 10-35 in quoque margine, falcati. Inflorescentia terminalis, ascendens; bracteae involucrales ovatae ad late lineares, acutae, appresso-pubescentes, tenues, ad 8-9 cm longae; flores *c.* 45-70 per capitulum, foetidi. Perianthium 43-52 mm longum, supra basin villosum. deinde glabrum, limbo 7-8 mm longo, parce hirsuto vel glabro. Pistillum leniter curvatum, 45-58 mm longum, supra basin pubescens, deinde glabrum; praebitor pollinis angustus, costatus, 4-5 mm longus. Folliculi obovati basi constricto, 18-19 mm longi, fere glabri.

Typus: Hopkins Reserve, SE of Kulin, Western Australia, 32°44'S, 118°17'E, 4 September 1986, *M. Pieroni s.n.* (*holo:* PERTH 03347869).

Shrub with prostrate stems, with lignotuber. *Stems* ± on surface, tomentose, with broadly linear prophylls at base of annual growth. *Leaves* crowded, erect, linear, pinnatifid, acute, pungent,

11-33 cm long, 7-14 mm wide, white-tomentose below; margins revolute; lobes 10-35 each side, broadly falcate, pungent, to 6 mm long, the upper margin less prominent than lower; petiole to 3 cm long. *Inflorescence* terminal, ascending; involucral bracts ovate to broadly linear, acute, appressed-pubescent, to 8-9 cm long; flowers *c.* 45-70 per head. *Perianth* 43-52 mm long, curled-villous above base, glabrous above; limb 7-8 mm long, swollen at base, sparsely hirsute to glabrous. *Pistil* gently curved, 45-58 mm long, pubescent above base; pollen presenter narrow, ribbed, 4-5 mm long. *Follicles* several, ± unilaterally obovate with constricted base, 18-19 mm long, almost glabrous, striate.

Selected collections examined. N side of Hopkins Reserve, *A.S. George* 17232 (PERTH); *c.* 14 km SE of Kulin, *R.J. Hnatiuk* 770134 (PERTH).

Distribution. Restricted to a small area south-east of Kulin.

Habitat. Grows in sandy loam in low kwongan and tall open shrubland.

Flowering period. August-September.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One. Known from only three sites in a nature reserve, between them containing fewer than 100 plants.

Etymology. Named from the Greek *mykter* (a nose, nostril) with the prefix *epi-* (upon); the flowers have a strong, unpleasant scent.

Discussion. A distinctive species in its prostrate habit, large conflorescence with acuminate, ± soft, mid-brown involucral bracts and unpleasantly scented flowers.

Dryandra proteoides Lindl., Sketch Veg. Swan R. xxxiii (1840) - *Josephia proteoides* (Lindl.) Kuntze, Revis. Gen. Pl. 2: 578 (1891) as *proteodes*. *Type*: south-western Western Australia, 183-, *J. Drummond s.n.* (*neo* (here nominated): K; *isoneo:* K (2 sheets)).

Typification. As with *D. nobilis*, there is no sheet at CGE. That selected as neotype is one of three sheets at Kew; it is from the Hookerian Herbarium and has the annotation 'Dryandra proteoides Lindl. Sw. riv. [i.e. Swan River] Drummond'.

Ser. 13 *Triangulares*

Dryandra ser. *Triangulares* A.S. George, ser. nov.

Frutices parvae rectae, plerumque dense foliatae, sine lignotubero. Folia magna, pinnatisecta lobis grandibus ± triangularibus. Inflorescentia in ramulo brevi laterali vel terminalis; bracteae involucrales quam flores breviores, angustae sed basi angusto, tomentosae. Perianthium rectum limbo grande recto. Pistillum curvatum, quam perianthio longiori; praebitor pollinis angustus, costatus. Folliculi elliptici ad late obovati vel orbiculares.

Typus: *D. drummondii* Meisn.

Small erect *shrubs*, usually densely leaved, without lignotuber. *Leaves* large, pinnatisect with large ± triangular lobes. *Inflorescence* on short lateral branchlet or terminal; involucral bracts shorter than flowers, usually narrow on thick base, hairy. *Perianth* straight with large erect limb. *Pistil* curved, longer than perianth or that of central flowers about as long; pollen presenter narrow, ribbed. *Faded flowers* soon falling. *Follicles* elliptic to broadly obovate or almost orbicular, usually remaining closed until burnt.

A series of 3 species. Although the heads are large as in ser. *Runcinatae*, the involucral bracts are much smaller and more hairy and the perianth is not succulent above the base.

Etymology. The epithet is from the Latin *triangularis* (triangular in shape) and refers to the large, triangular leaf lobes of species in the series.

Dryandra drummondii Meisn., in J.G.C. Lehmann (ed.), Pl. Preiss. 2: 267 (1848). *Type*: south-western Western Australia, 184-, *J. Drummond* 3: 299 (*iso:* BM (2 sheets), K (3 sheets), MEL).

Three subspecies are recognized.

1 Pistil 60-69 mm long, red ..... subsp. **macrorufa**

1: Pistil 43-60 mm long, yellow

2 Perianth limb 11-13 mm long; pollen presenter 7.5-10 mm long; flowers in summer ..... subsp. **drummondii**

2: Perianth limb 9 mm long; pollen presenter 6.5 mm long; flowers in winter ..... subsp. **hiemalis**

Dryandra drummondii Meisn. subsp. **drummondii**

D. calophylla var. *acaulis* Meisn., in A.L.P.P. de Candolle, Prodr. 14: 481 (1856). *Type*: south-western Western Australia, 184-, *J. Drummond* 2: 300 (*iso:* BM, K (2 sheets), MEL).

Shrub to 1 m. *Leaf* lamina 20-90 cm long; petiole 5-15 cm long. *Perianth* 40-42 mm long; limb 11-13 mm long. *Pistil* 47-53 mm long; pollen presenter 7.5-10 mm long. *Follicles* 16-18 mm long.

Distribution. Occurs in the Stirling Range, south to Kendenup and South Stirling and north-east towards Ongerup.

Habitat. Grows in sandy loam over gravel in mallee kwongan.

Flowering period. November-January.

Dryandra drummondii subsp. **hiemalis** A.S. George, subsp. nov.

Ab subspeciebus aliis limbo perianthii breviore (*c.* 9 mm longo), praebitore pollinis breviore (*c.* 6.5 mm longo) et florescentia hiemali differt.

Typus: 5 km N of Calingiri turnoff, Great Northern Hwy, Western Australia, 1 June 1984, *A.S. George* 16300 *& P. Nikulinsky* (*holo:* PERTH 03462552; *iso:* AD, BRI, CANB, K, MEL, NSW, PERTH 03462560, 03462579).

Shrub to 50 cm tall. *Leaf* lamina 17-30 cm long; petiole 6-9 cm long. *Perianth* 37-42 mm long; limb *c.* 9 mm long. *Pistil* 43-54 mm long; pollen presenter *c.* 6.5 mm long. *Follicles* 17-20 mm long, glabrous.

Selected collections examined. Coffin Rock [SW of York], *H. Demarz* 1297 (PERTH); S of North Rd, near Bindoon, Great Northern Hwy, *M. Pieroni* 93/5 (PERTH); S of Wickepin, 16 May 1979, *K. Wallace* (PERTH).

Distribution. Occurs between New Norcia and Wickepin.

Habitat. Grows in lateritic gravel in Jarrah-Marri open forest and Wandoo woodland.

Flowering period. May-June.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The Latin *hiemalis* (of winter) refers to the flowering period which contrasts with the summer flowering of the two other subspecies.

Discussion. Flowers faintly scented.

Dryandra drummondii subsp. **macrorufa** A.S. George, subsp. nov.

Ab subspeciebus aliis foliis majoribus (lamina 15-36 cm longa), floribus majoribus (perianthium 55-56 mm longum; pistillum 60-69 mm longum), et pistillo rufo, differt.

Typus: 3.3 km E on South Fence Rd from Kuringup Rd, SE of Nyabing, Western Australia, 5 January 1992, *M. Pieroni* 92/1 (*holo:* PERTH 02003813; *iso:* CBG, K).

Shrub to 1.5 m tall and 2 m wide. *Leaf* lamina 15-36 cm long; petiole 4-15 cm long. *Perianth* 55-56 mm long; limb *c.* 14 mm long. *Pistil* 60-69 mm long, crimson; pollen presenter *c.* 9.5 mm long. *Follicles* not seen.

Distribution. Known only from the type.

Habitat. Grows in sand over gravel, in low kwongan.

Flowering period. January.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One.

Etymology. Epithet from the Greek *macro-* (large) and the Latin *rufus* (red), in reference to the large flowers with red styles. It is known as 'Big Red'.

Discussion. The single collection of this taxon is distinguished from all other collections of the species by its larger size and red style.

Dryandra octotriginta A.S. George, sp. nov.

Ab *D. drummondii* Meisn. caulibus longioribus (frutex ad 1 m altus), foliorum lobis ± planis marginibus rectis, et inflorescentiis numerosioris, praecipue differt.

Typus: Manuel Rd, S of Nyabing, Western Australia, 33°27'S, 118°10'E, 30 July 1986, *A.S. George* 16695 (*holo:* PERTH 04110617; *iso:* CANB, K, MEL, NSW).

Shrub to 1 m, without lignotuber. *Stems* erect, with thick, ± lanceolate, villous prophylls. *Leaves* deeply pinnatipartite to almost pinnatisect, bluish green; lamina 10-25 cm long, 3-6 cm wide; lobes 10-18 each side, triangular, usually narrow and ± straight-sided, decurrent, at 70°-80°, the pits on undersurface indistinct, shallow; margins almost flat to shortly recurved; petiole 3-6 cm long. *Inflorescence* with linear, leaf-like bracts around involucre; involucral bracts ovate-lanceolate, to 10-20 mm long, rusty-villous; flowers 50-85 per head. *Perianth* 35-43 mm long, pale gold; claws curled-villous to tomentose; limb 8-11 mm long, appressed-silky with long terminal tuft. *Pistil* 40-48 mm long, bowed, very thick towards base, glabrous, cream; pollen presenter narrowly fusiform, 5-7.5 mm long, ribbed, green. *Follicles* obovate, 13 mm long, 12 mm wide, sparsely hairy, striate, shining, ± viscid.

Selected collections examined. c. 21 km S of Hyden, *A.S. George* 9888 (PERTH); Wingedine Reserve, W of Woodanilling, *A.S. George* 16649 (PERTH); 15 km S of Kulin, *R.J. Hnatiuk* 770427 (PERTH).

Distribution. Occurs from Woodanilling to Nyabing and east to Newdegate and Dragon Rocks.

Habitat. Grows in gravelly loam in kwongan, often with mallee eucalypts.

Flowering period. July-August.

Conservation status. Not endangered.

Etymology. Name adapted from the Latin for 38, this being the number given to the taxon in a preliminary list of new taxa and used to refer to it by members of the Dryandra Study Group of the Society for Growing Australian Plants.

Discussion. Closely related to *D. drummondii*, differing in the longer stems, more floriferous habit and the more acute leaf lobes with straighter sides. Usually the leaf lobes are narrower than those of *D. drummondii* and there are more small leaves below the inflorescence. Variable in flower size.

Dryandra catoglypta A.S. George, sp. nov.

Ab *D. drummondii* Meisn. et *D. octotriginta* A.S. George bracteis caulorum late ovato-oblongis recurvis, perianthii limbo longiore (12-15 mm longo), et praebitore pollinis longiore (8-9 mm longo) angustiore, differt.

Typus: N of Badgingarra, Western Australia, 22 July 1993, *M. Pieroni* 93/7 (*holo:* PERTH 04083792; *iso:* AD, BRI, CANB, K, MEL, NSW, PERTH).

Shrub to 1 m tall and 1 m wide, without lignotuber. *Stems* with broadly ovate-oblong bracts at base of annual increment, tomentose outside, glabrous inside, usually recurved. *Leaves* pinnatisect; lamina 15-30 cm long, 2.5-7 cm wide; lobes 10-15 each side, triangular, acute, pungent, at 80°-90°, the upper margin ± straight to gently curved, the lower more convex; pits in lower surface indistinct, shallow; margins flat; petiole 1.5-8 cm long. *Inflorescence* terminal to short branchlet, with several linear, leaf-like bracts around involucre; involucral bracts broadly ovate-oblong, silky-villous, to 25 mm long; flowers 85-110 per head. *Perianth* 44-56 mm long, villous with pale hairs becoming silky towards limb; limb very narrow, 12-15 mm long, appressed-silky with pale hairs and a terminal rusty-red tuft. *Pistil* 46-64 mm long, bowed, glabrous; pollen presenter narrow, ribbed, 8-9 mm long, dull reddish pink. *Follicles* broadly obovate, 15-17 mm long, 17-20 mm wide, loosely hirsute, glabrescent, striate, shining.

Selected collections examined. Near Tootbardi Road, N of Badgingarra, *K. Alcock* 507 (PERTH); Gardner Range, July 1980, *D. Lievense* (PERTH).

Distribution. Occurs in the Gardner Range and north of Badgingarra.

Habitat. Grows on lateritic breakaways in kwongan.

Flowering period. June-July.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One.

Etymology. Named from the Greek *glyptos* (carved) with the prefix *cato-* (downwards), in reference to the bracts on the stem which appear as though cut back and curled downwards.

Discussion. Closely related to *D. drummondii* and especially *D. octotriginta*, differing mainly in the prominent recurved bracts on the stems, the longer perianth limb and longer, very narrow pollen presenter. Old flowers caducous. Follicles loosely attached.

Ser. 14 *Aphragma*

Dryandra ser. *Aphragma* (R. Br.) A.S. George, stat. nov.

Dryandra sect. *Aphragma*, R. Br., Suppl. Prodr. Fl. Nov. Holl. 37 (1830) - *Josephia* sect. *Aphragma* (R. Br.) Kuntze, in T.E. von Post & C.E.O. Kuntze, Lex. Gen. Phan. 299 (1903). *Type*: *D. nervosa* R. Br.

Prostrate or erect *shrubs*, with or without lignotuber. *Leaves* large, pinnatipartite to pinnatifid. *Inflorescence* terminal, usually subtended by long leaves; receptacle ± flat; involucral bracts shorter than flowers, villous, hirsute or pubescent all over. *Perianth* straight, with long limb. *Pistil* curved, shorter or in 1 species longer than perianth; pollen presenter elongated, narrow, striate. *Faded flowers* soon falling. *Follicles* rather large, obovate, usually remaining closed until burnt, rather loosely attached.

A series of 9 species. Similar to ser. *Triangulares* but with much narrower leaf lobes and the pistil usually shorter than the perianth.

Dryandra pteridifolia R. Br., Trans. Linn. Soc. London 10: 215 (1810) - *Josephia pteridifolia* (R. Br.) Poir., Dict. Sci. Nat. 245 (1822). *Type*: Bay I [Lucky Bay, E of Esperance, Western Australia], January 1802, *R. Brown* Iter Australiense 3426 (*holo:* BM; *iso:* K (2 sheets)).

There are 2 subspecies.

1 Leaf lobes usually twisted; autumn-flowering (south coast) ..... subsp. **pteridifolia**

1: Leaf lobes not twisted; spring-flowering (north of Perth) ..... subsp. **vernalis**

Dryandra pteridifolia R. Br. subsp. **pteridifolia**

Leaf lobes usually twisted. *Perianth* 36-39 mm long. *Pistil* 38-53 mm long; pollen presenter 4.5-5 mm long.

Distribution. Occurs from the Gairdner River to Cape le Grand National Park and inland to Newdegate.

Habitat. Grows in sandy loam, sometimes over clay or laterite, in kwongan.

Flowering period. March-May.

Dryandra pteridifolia subsp. **vernalis** A.S. George, subsp. nov.

Ab subsp. *pteridifolia* lobis foliorum non vel parum contortis, praebitore pollinis longiore (8 mm longo) et florescentia vernali, differt.

Typus: Alexander Morrison National Park, Western Australia, 30°04'S, 115°31'E, 25 September 1994, *A.S. George* 17215 (*holo:* PERTH 04228782; *iso:* AD, BRI, CANB, K, MEL, NSW, PERTH 04228790, 04228804).

Leaf lobes not or little twisted. *Perianth c.* 39 mm long. *Pistil* 40-45 mm long; pollen presenter *c.* 8 mm long.

Selected collections examined. Marchagee Track, *E.A. Griffin* 3475 (PERTH); Bundarra Nature Reserve, S of Dandaragan, *E.A. Griffin* 5425 (PERTH).

Distribution. Occurs between Eneabba and Mogumber.

Habitat. Grows in sandy loam over gravel in low kwongan.

Flowering period. September-October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The Latin epithet *vernalis* (of springtime) refers to the flowering time of the subspecies; subsp. *pteridifolia* flowers in autumn.

Dryandra fililoba A.S. George, sp. nov.

Ad *D. nervosam* R. Br. arcte affinis, a qua lobis inferis foliorum filiformibus et floribus longioribus (perianthio 50-53 mm longo limbo 15-18 mm longo, pistillo 49-52 mm longo), praecipue differt.

Typus: 29 km W of Lake Grace, Western Australia, 33°07'S 118°10'E, 30 July 1986, *A.S. George* 16709 (*holo:* PERTH 04110366; *iso:* CANB, NSW, PERTH 04110374, 04110382).

Tangled *shrub* to 1 m, without lignotuber. *Stems* tomentose and hirsute. *Leaves* deeply pinnatipartite; lamina 15-30 cm long, 7-14 cm wide; lobes 10-17 each side at 70°-90°, linear, acute, pungent; margins recurved to revolute; petiole 5-15 cm long; several to many small leaves 5-15 cm long with filiform lobes subtending inflorescence. *Inflorescence* terminal, surrounded by leaves; involucral bracts ovate to oblong, obtuse, rusty-silky-villous and densely ciliate, the innermost bracts 25-42 mm long; flowers 55-80 per head. *Perianth* 50-53 mm long, densely curled-villous above base, then curled-tomentose, the limb silky with long apical tuft; limb 15-18 mm long, acute. *Pistil* 49-52 mm long, glabrous; pollen presenter narrowed, ribbed, 12-15 mm long. *Follicles* obovate, somewhat oblique across upper margin, 17 mm long, somewhat villous but hairs wearing off.

Selected collections examined. 1.5 km E of Dudinin, *K. Alcock* 484 (PERTH); E of Harrismith, *R.J. Hnatiuk* 780023 (PERTH).

Distribution. Occurs from south of Lake Dumbleyung to Lake Grace and north to Harrismith.

Habitat. Grows in sandy loam over gravel or in gravel, in kwongan, occasionally in *Eucalyptus wandoo* woodland.

Flowering period. Mainly May-July.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. Named from the Latin *filum* (a thread) and *lobus* (a lobe), in reference to the fine lower lobes of the leaves.

Discussion. May usually be distinguished by the bushy, non-lignotuberous habit, leaves with many fine lower lobes and large flowers with very long perianth limb. Larger leaf lobes generally fewer and flatter than those of *D. pteridifolia*; stem below inflorescence usually longer, up to 5 cm.

Dryandra nervosa R. Br., in Sweet, Fl. Australasica t. 22 (1827). *Type*: raised at the nursery of Mr Mackay at Clapton, England, from seed collected probably near King George Sound by *W.Baxter*; *neo* (here nominated): BM.

Typification. There is one specimen on a sheet at BM with these details but not annotated by Brown. It agrees with the protologue.

Dryandra blechnifolia R. Br, Trans. Linn. Soc. London 10: 215 (1810) - *Josephia blechnifolia* (R. Br.) Poir., Dict. Sci. Nat. 24: 246 (1822) - *Dryandra pteridifolia* var. *blechnifolia* (R. Br.) R. Br., Suppl. Prodr. Fl. Nov. Holl. 38 (1830). *Type*: near King George Sound, [Western Australia], September 1791, *A. Menzies* (*lecto* (here chosen): BM; *isolecto:* BM, K).

Typification. There are two sheets at BM with specimens of this species collected by Menzies. The specimens are in leaf only. The lectotype is specimen 'a' on a sheet annotated by Brown.

Dryandra porrecta A.S. George, sp. nov.

Ad *D. blechnifoliam* R. Br. affinis, a qua omnino minore: lamina foliorum 15-30 cm longa, 2-3 cm lata; bracteae involucrales ad 25 mm longae; flores 20-30 per capitulum; perianthium et pistillum 37-40 mm longum.

Typus: Bibiking Reserve, ENE of Woodanilling, Western Australia, *c.* 33°32'S, 117°44'E, 26 July 1986, *A.S. George* 16629 (*holo:* PERTH 04228847; *iso:* CANB, K, MEL, NSW, PERTH 04228855).

A sprawling *shrub* to 3 m across. *Stems* prostrate, underground, tomentose; prophylls imbricate on leafy branchlets, sparse elsewhere. *Leaves* immediately below but not surrounding flowers, pinnatipartite, 15-30 cm long, 2-3 cm wide; margins slightly recurved; lobes 30-40 each side, narrowly triangular, acute, somewhat twisted at base, to 16 mm long, tomentose and with evident nerves below; petiole 2-3.5 cm long, tomentose. *Inflorescence* terminal; involucral bracts ovate to oblong, obtuse, to 25 mm long, rusty-villous outside; flowers 20–30 per head. *Perianth* 37-40 mm long, curled-tomentose above base, pubescent above; limb 9-10 mm long, appressed-hirsute. *Pistil* straight or gently curved, 37-40 mm long, glabrous; pollen presenter narrow, 5-6 mm long, ribbed. *Follicles* 1 or 2, obovate, 11-15 mm long, almost glabrous, striate, shining.

Selected collections examined. SSE of Pingrup, *K. Alcock* 341 (PERTH); Mt Barker, Dec. 1898, *R. Helms* (PERTH); N of Kojonup, *K. Newbey* 3054 (PERTH).

Distribution. Occurs at scattered localities between Woodanilling, Ongerup and Mount Barker and a short distance westward.

Habitat. Grows on sandy and sandy loam flats in low kwongan, often with Cyperaceae, Restionaceae and mallee eucalypts, occasionally in open woodland.

Flowering period. July.

Conservation status. Not endangered.

Etymology. Named from the Latin *porrectus* (from *porrigo*, to spread out, extend), in reference to the habit.

Discussion. Closely related to *D. blechnifolia* but smaller in all parts and with fewer flowers per head. Also related to *D. calophylla* but has more numerous, narrower, often twisted leaf lobes, larger involucral bracts and a much shorter perianth limb and pollen presenter.

Dryandra aurantia A.S. George, sp. nov.

Ad *D. porrectam* A.S. George affinis, a qua foliorum lobis paucioribus (18-28 in quoque margine), floribus per capitulum *c.* 80, perianthio aurantio, et pistillo breviore (33-36 mm longo) praecipue differt. Ab *D. blechnifolia* R. Br. foliis angustioris (2.5-4.5 cm latis), floribus aurantiis et florescentia autumnali praecipue differt.

Typus: Little Darkin Swamp, Western Australia, 32°03'17"S, 116°31'39"E, 26 April 1994, *A.S. George* 17206 *& M. Pieroni* (*holo:* PERTH 04228510; *iso:* AD, CANB, K, MEL, NSW, PERTH 04228529, 04228537, 04228545).

Stems underground, rusty-villous, with triangular to ovate villous bracts. *Leaves* deeply pinnatipartite, acute, mucronate; lamina 12-25 cm long, 2.5-4.5 cm wide, decurrent almost to base; lobes 18-28 each side, linear, tapering, acute, straight to curved, at *c.* 90°, rusty-villous, glabrescent except pits in lower surface; reticulation prominent below. *Inflorescence* terminal; involucral bracts ovate to lanceolate, obtuse, red-rusty villous, the longest ones 20-23 mm long; receptacle flat; flowers *c.* 80 per head. *Perianth* 34-37 mm long, rusty curled-villous above base, the claws curled-tomentose, pale orange-pink; limb 8-10 mm long, tomentose with straight hairs and an apical rusty tuft. *Pistil* 33-36 mm long, glabrous; pollen presenter narrowed, ribbed, 5-8 mm long. *Follicles* broadly obovate, 15-16 mm long, 10-14 mm wide, sparsely hairy on margin, striate, somewhat shining.

Distribution. Known only from the type locality.

Habitat. Grows in deep white sand in low kwongan with scattered *Hakea prostrata* and *Banksia attenuata*.

Flowering period. April.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One. There are 20-30 plants at the type locality.

Etymology. Named from the Latin *aurantius* (orange-coloured with a reddish tinge), in reference to the perianth.

Discussion. Distinguished by the underground stems with pale brown bracts, broadly triangular leaf lobes (smaller than in *D. blechnifolia*) and small flowers. Receptacle gently convex. Floral bracts appear to be few. Close to *D. porrecta* but differs in the more numerous flowers per head, the orange perianth that is very woolly above the base and the autumn flowering period.

Dryandra lepidorhiza A.S. George, sp. nov.

Species bene distincta. Frutex cum lignotubero. Caules subterranei, bracteis ovatis obtusis villosis vestiti. Folia pinnatipartita, lobis in quoque margine 15-25 linearibus pungentibus marginibus revolutis; lamina 15-30 cm longa, 2-7 cm lata, primum rufo-villosa, supra glabrescens. Inflorescentia terminalis, primum foliis non circumnexa; bracteae involucrales lanceolatae, acutae, villosae, interiores 9-10 mm longae; flores 25-30 per capitulum. Perianthium rectum, 32-34 mm longum, supra basin villosum, deinde pubescens; limbus 10 mm longus, hirsutus. Pistillum 31-33 mm longum, glabrum; praebitor pollinis angustus, costatus, 6 mm longus. Folliculi late obovati, 10-15 mm longi, glabri.

Typus: Reserve 15801, W of Woodanilling, Western Australia, 33°35'S, 117°22'E, 4 November 1986, *A.S. George* 16879 (*holo:* PERTH 03322777; *iso:* CANB, K, MEL, NSW, PERTH 03222785).

Shrub with underground prostrate stems, to 1.5 m diam., with lignotuber. *Stems* covered with ovate, obtuse villous bracts 4-6 mm long. *Leaves* pinnatipartite, dull green; lamina 15-30 cm long,

2-7 cm wide; lobes 15-25 each side, linear, acute, pungent, 2-3 mm wide, rusty-tomentose below; margins revolute; petiole 3-4 cm long. *Inflorescence* terminal, at first not subtended by leaves; involucral bracts narrowly lanceolate, acute, rusty-villous, glabrous inside, the innermost ones 9-10 mm long; flowers 25-30 per head. *Perianth* 32-34 mm long, villous above base, the claws pubescent, dull red-pink, almost white at base; limb 10 mm long, hirsute, the apical hairs longer. *Pistil* 31-33 mm long, glabrous, cream at base, dull yellow above; pollen presenter narrow, 6 mm long, ribbed. *Follicles* broadly obovate, 10-15 mm long, glabrous, moderately shining.

Selected collection examined. W of Woodanilling, *K. Newbey* 2771 (PERTH).

Distribution. Restricted to the type locality. At PERTH there is a 1963 collection by K. Newbey, no. 916, from the 'Ongerup area' but this may not be correct since his field book gives '10 miles NW of Cranbrook' as the locality.

Habitat. Grows in sandy loam over laterite, in low kwongan.

Flowering period. October-November.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One. The population is at the edge of a small reserve but next to a gravel pit.

Etymology. Epithet from the Greek *lepis* (a scale) and *rhiza* (a root), in reference to the stems being covered in scale-like 'bracts'.

Discussion. New growth rusty-red. Flowers ± scentless. A distinctive species characterized by the underground stems covered with bracts, the narrowly lobed pinnatisect leaves, the heads with a short involucre. Probably related to *D. calophylla* which also has underground stems but has triangular-lobed leaves, few bracts on the stems and dull yellow flowers.

Ser. 15 *Ionthocarpae*

Dryandra ser. *Ionthocarpae* A.S. George, ser. nov.

Frutices recti ramosissimi sine lignotubero. Folia pinnatifida. Inflorescentiae terminales, arctae successivae. Perianthium rectum, limbo longo. Pistillum ante anthesin valde curvatum, demum recurvum, perianthio longius; praebitor pollinis elongatus, costatus. Flores mox cadentes. Folliculi obovoidei, caespite prominenti terminali pilorum ferrugineorum.

Typus: *D. ionthocarpa* A.S. George

Small erect bushy *shrubs* without lignotuber. *Leaves* pinnatifid. *Inflorescences* terminal, crowded. *Perianth* straight; limb large. *Pistil* curved, longer than perianth; pollen presenter elongate, ribbed. *Faded flowers* soon falling. *Follicles* obovoid, with a prominent terminal tuft of long, rusty hairs, usually remaining closed until burnt. *Seed* obovate, without wing.

A monotypic series confined to one population north of Albany. Flowers similar to ser. *Triangulares* but the fruit is distinctive.

Etymology. Named for the type (and only) species of the series.

Dryandra ionthocarpa A.S. George, sp. nov.

Frutex ad 60 cm latus. Caules prostrati, villosi, prophyllis multis linearibus tomentosis. Folia 8-25 cm longa, 5-20 mm lata, lobis 15-35 in quoque margine, triangularibus, obtusis, marginibus planis. Inflorescentiae terminales, confertae; bracteae involucrales lineares-subulatae, interiores lanceolatae, ad 2 cm longae, tomentosae; flores 40-60 per capitulum. Perianthium 39-43 mm longum, lilacino-salmoneum, ad basin crispo-tomentosum, supra pubescens, limbo 7-8 mm longo, flavo, appresso-puberulo. Pistillum 43-44(57) mm longum, in dimidio infero pilosum, supra glabrum; praebitor pollinis 3.5-4.8 mm longus. Folliculi 5-6 mm longi.

Typus: near Kamballup, Western Australia, 34°34'S 117°59'E, 11 October 1988, *P. Luscombe* (*holo*: PERTH 03462099; *iso:* AD, CANB, K, MEL, NSW, PERTH 03462102).

Shrub to 60 cm wide. *Stems* prostrate, short, ± underground, villous; prophylls many, linear, tomentose. *Leaves* pinnatifid, 8-25 cm long, 5-20 mm wide; margins flat; lobes 15-35 each side, triangular, obtuse, ± flat, rusty-villous when young, later glabrous except pits; petiole 4-6 cm long, ± glabrous. *Infloresence* terminal, subtended by leaves, closely successive; involucral bracts linear-subulate, the inner ones narrowly lanceolate, to 2 cm long, dark rusty-tomentose; flowers 40-60. *Perianth* 39-43 mm long, curled-tomentose in lower third, pubescent above, pink-mauve with yellow limb; limb 7-8 mm long, keeled, appressed-puberulous. *Pistil* 43-44(57) mm long, curved, pilose in lower half, cream; pollen presenter 3.5-4.8 mm long, ribbed, green. *Follicles* ± obovate, 5-6 mm long, with an apical tuft of long rusty hairs, glabrous below.

Selected collections examined. W of Kamballup, *M. McDonald* 1551-60 (PERTH); Kamballup, 20 September 1988, *M. Pieroni* (PERTH).

Distribution. Known only from the type locality.

Habitat. Grows in spongolitic gravel in low kwongan.

Flowering period. September-October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Declared Rare. There are *c.* 200 plants at the type locality.

Etymology. The specific epithet is taken from the Greek *ionthas* (shaggy) and *carpos* (a fruit), in reference to the prominent tuft of hairs on the follicle.

Discussion. This very distinctive, rare species was discovered by Peter Luscombe in 1987. It is easily recognized by the fruit and is unusual in having floral bracts that do not elongate as the fruit develop. The robust pistils are prominently bowed before anthesis, then recurved very strongly afterwards.

Ser. 16 *Inusitatae*

Dryandra ser. *Inusitatae* A.S. George, ser. nov.

Frutices ramosissimi sine lignotubero. Folia pinnatifida, magna. Inflorescentia ad apice caulis conferta; bracteae involucrales flores excedentes, ± papyraceae, arachnoideae. Perianthium rectum limbo recto. Pistillum rectum, perianthio breviore; praebitor pollinis elongatus, angustus. Flores veteres ?persistentes. Folliculi obovati, glabri, leniter affixi.

Typus: *D. idiogenes* A.S. George

Small bushy *shrubs* without lignotuber. *Leaves* large, pinnatifid. *Inflorescences* crowded at stem apex; involucral bracts exceeding flowers, ± papery, with cobwebby indumentum. *Perianth* straight including limb. *Pistil* straight, shorter than perianth; pollen presenter elongated, not thickened. *Old flowers* ?persistent. *Follicles* obovate, glabrous, easily detached. *Seed* winged.

Monotypic, restricted to the Newdegate area. The involucral bracts are unusual in their texture and indumentum. Foliage similar to that of series *Triangulares* and *Ionthocarpae*, flowers similar to those of series *Gymnocephalae*.

Etymology. Named from the Latin *inusitatus* (rare, unusual), the only species of the series being of restricted occurrence and having some unusual morphological characteristics.

Dryandra idiogenes A.S. George, sp. nov.

Frutex ad 70 cm altus. Caules hirsuti, prophyllis tenuibus tecti. Folia 15-37 cm longa, 12-38 mm lata, lobis 20-35 in quoque latera, triangularibus acutis, marginibus planis, illis ad basin folii recurvis. Inflorescentiae terminales, confertae; bracteae involucrales lineares ad lanceolatae, acutae, ad 45 mm longae, exteriores fere glabrae, interiores in costa pubescentes, marginibus superis arachnoideis; flores *c.* 80 per capitulum. Perianthium 36-44 mm longum limbo 10-11 mm, ad basin album, supra rubra, tomentosum praeter limbum glabrum. Pistillum 35-39 mm longum, ad basin hirsutum, supra glabrum; praebitor pollinis 6-7 mm longus. Folliculi 12-13 mm longi, glabri.

Typus: South Burngup Rd, SW of Newdegate, Western Australia, 33°12'S, 118°49'E, 30 August 1986, *A.S. George* 16713 (*holo:* PERTH 04225813; *iso:* CANB, K, MEL, NSW, PERTH 04225821, 04225848).

Tufted *shrub* to 70 cm diam. without lignotuber. *Stems* hirsute, covered with thin brown prophylls to 3 cm long. *Leaves* deeply pinnatifid, acute or truncate; lamina 15-37 cm long, 12-38 mm wide, tomentose in pits below; margins flat or slightly recurved; lobes 20-25 each side, triangular, to 19 mm long, acute, smaller and ± recurved towards base, prominently nerved and reticulate below; petiole to 9 cm long. *Inflorescences* terminal, closely successive; involucral bracts linear to narrowly lanceolate, acute, to 45 mm long, the outer ones almost glabrous, inner ones rusty-pubescent along midrib with the upper margins cobwebby; flowers *c.* 80 per head. *Perianth* 36-44 mm long, white in lower 1/2, deep red above, curled-tomentose above base, appressed-tomentose above, the limb glabrous except long apical hairs; limb 10-11 mm long. *Pistil* straight, 35-39 mm long, hirsute at base, glabrous above; pollen presenter 6-7 mm long, not thickened. *Follicles* several, obovate, unequally constricted towards base, 12-13 mm long, glabrous.

Selected collection examined. South Burngup Rd, SW of Newdegate, *A.S. George* 16732 (AD, CANB, PERTH).

Distribution. Restricted to a small area south-west of Newdegate.

Habitat. Grows in sandy loam over gravel in kwongan and mallee kwongan.

Flowering period. August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One. The populations appear to be small. One is in a nature reserve.

Etymology. The species is named from the Greek *idiogenes* (distinctive, peculiar), in reference to the unusual features, especially the papery involucral bracts with cobwebby indumentum and the striking red and white flowers.

Discussion. A distinctive species with striking red and white flowers surrounded by papery involucral bracts that are cobwebby on the upper margins. The flowers are strongly scented.

Ser. 17 *Subulatae*

Dryandra ser. *Subulatae* A.S. George, ser. nov.

Frutices parvae sine lignotubero. Folia linearia, integra. Inflorescentia terminalia in ramulo brevi ad basin fruticis, foliis parvis rigidis subulatis scabridis subtenta; bracteae involucrales floribus breviores. Perianthium rectum. Pistillum rectum, perianthio parum brevius; praebitor pollinis vix incrassatus. Flores veteres persistentes. Folliculi orbiculares.

Typus: *D. subulata* C.A. Gardner

Small *shrubs* without lignotuber. *Leaves* linear, entire. *Inflorescence* terminal on short branchlet arising immediately below that of previous season, surrounded by small rigid scabrid subulate leaves passing into involucre; involucral bracts shorter than flowers. *Perianth* straight, including limb. *Pistil* straight, slightly shorter than perianth; pollen presenter scarcely thickened. *Old flowers* persistent. *Follicles* orbicular with basal notch, usually remaining closed until burnt.

Monotypic, in the kwongan north of Perth. The linear, entire leaves, subulate floral leaves and orbicular follicles are distinctive. The flowers have a similar form to those of ser. *Gymnocephalae*, i.e. they are straight, and apart from some loose, caducous hairs on the limb apex, are clearly distinct from each other just before anthesis.

Etymology. Named after the type (and only) species in the series.

Ser. 18 *Gymnocephalae*

Dryandra ser. *Gymnocephalae* Benth., Fl. Austral. 5: 565, 579 (1870). *Type*: *D. shuttleworthiana* Meisn., *lecto* (here chosen).

Dryandra § *Haplophyllae* Meisn. in A.L.P.P. de Candolle, Prodr. 14: 479 (1856). *Type*: *D. speciosa* Meisn.

Mostly erect or spreading *shrubs*, with or without lignotuber. *Leaves* linear, serrate, pinnatifid, pinnatisect or in 1 species entire. *Inflorescence* terminal or axillary, sometimes on old stems; involucral bracts shorter or longer than flowers, usually narrow and very hairy. *Perianth* straight including limb, not relaxed at anthesis. *Pistil* straight, shorter than perianth; pollen presenter narrow, smooth or ribbed. *Old flowers* persistent or soon falling. *Follicles* obovate-oblong or semi-elliptic, sometimes oblique, usually hairy, usually remaining closed until burnt. *Seed* body basal with markedly narrowed base; wing with or without notch.

A series of 8 species, mostly in the kwongan between Eneabba and Lake King. Just before anthesis the flowers are spaced rather openly in the head. The perianth is quite rigid and at anthesis does not relax, the limb remaining loosely around the pollen presenter.

Typification. Bentham included three species in this series, of which one (*D. tridentata*) is here placed in ser. *Acrodontae* Meisn., the two other retained here. Of these, *D. shuttleworthiana* is considered to be more appropriate as lectotype since it has no floral leaves as described in the diagnosis, whereas *D speciosa* usually has some.

Dryandra erythrocephala C.A. Gardner, J. Roy. Soc. W. Australia 13: 63, fig. 35 A-H (1927). *Type*: E of Pingrup and S of Newdegate, Western Australia, 15 December 1926, *C.A. Gardner s.n.* (*iso:* MEL, PERTH (3 sheets)).

There are two varieties.

1 Perianth 32-40 mm long, red-black in upper third ..... var. **erythrocephala**

1: Perianth 26-28 mm long, yellow in upper third ..... var. **inopinata**

Dryandra erythrocephala C.A. Gardner var. **erythrocephala**

Perianth 32-40 mm long, red-black in upper third. *Pistil* 31-36 mm long.

Distribution. As for the species.

Habitat. Grows in sandy loam over laterite, in open mallee kwongan.

Flowering period. Mainly January-June.

Dryandra erythrocephala var. **inopinata** A.S. George, var. nov.

Ab *Dryandra erythrocephala* var. *erythrocephala* perianthio 26-28 mm longo, ad apicem flavo, et pistillo 25-27 mm longo, differt.

Typus: Hopkins Reserve, SE of Kulin, Western Australia, 32°44'S, 118°17'E, 1 August 1986, *A.S. George* 16743 (*holo:* PERTH 04228758; *iso:* CANB, K, MEL, NSW).

Perianth 26-28 mm long, yellow in upper third. *Pistil* 25-27 mm long.

Selected collections examined. North Kukerin-Tarin Rock Rd, 10 km SE of intersection with Muller and Springhurst/Boundary and unnamed road, *K. Alcock* 345 (MEL); S of Nyabing, *c.* 33° 37'S, 118° 10'E, *A.S. George* 16697 (PERTH).

Distribution. Recorded near Kulin and Nyabing.

Habitat. Grows in sand over laterite in kwongan.

Flowering period. Late flowers have been recorded in August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two. Because of its similarity to var. *erythrocephala*, this has been little collected, hence distributional data are few.

Etymology. Named from the Latin *inopinatus* (unexpected), in reference to the flower colour which is quite unlike that of var. *erythrocephala*.

Discussion. Although readily separable from typical *D. erythrocephala* by the smaller, yellow flowers, this has exactly its habit, foliage and indumentum and hence is retained in that species.

Dryandra viscida A.S. George, sp. nov.

Ab speciebus aliis ser. *Gymnocephalae* bracteis involucralibus, basi perianthii et folliculis viscidis, praecipue differt.

Typus: Hatter Hill, Western Australia, 32°50'S, 119°59'E, 30 July 1969, *A.S. George* 9446 (*holo:* PERTH 03262316; *iso:* CANB, K, MEL, NSW, PERTH 03262324, 03262332).

Dense, rounded *shrub* to 1 m, without lignotuber. *Stems* hirsute, densely leaved and with many prophylls. *Leaves* linear, pinnatifid, acute, pungent, 15-35 cm long, 5-10 mm wide, rusty-tomentose in pits below; margins revolute, with 25-75 triangular pungent lobes to 4 mm long each side; petiole to 5 mm long. *Inflorescences* terminal, closely successive; involucral bracts linear, acuminate, rather soft, to 6 cm long, the outer viscid-hirsute, inner hirsute on upper margin; flowers *c.* 55 per head. *Perianth* 55-56 mm long, hirsute above base, then glabrous except for coarse hairs on limb until anthesis, golden yellow; limb 14-15 mm long. *Pistil* straight or gently bowed, 54-55 mm long, sparsely hirsute above ovary, glabrous above, yellow; pollen presenter gradually narrowed, *c.* 10 mm long, obscurely ribbed. *Follicles* several, ± oblong with narrowed base, 15-16 mm long, sparsely hairy, viscid.

Selected collections examined. South Ironcap, *J.S. Beard* 3735 (PERTH); W of Digger Rocks, *c.* 25 km E of Varley, *S.D. Hopper* 5300 (PERTH).

Distribution. Restricted to Digger Rocks, Middle and South Ironcap and Hatter Hill.

Habitat. Grows in laterite in thick scrub.

Flowering period. August-September.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The epithet, from the Latin *viscidus* (sticky), refers to the involucral bracts, the sticky nature being unusual in the genus.

Discussion. A distinctive species with viscid involucral and floral bracts and perianth bases, the follicles large and also somewhat viscid. Tepals very slender with long limb. Pollen presenter not clearly demarcated at base.

Dryandra speciosa Meisn., in A.L.P.P. de Candolle, Prodr. 14: 479 (1856) - *Josephia speciosa* (Meisn.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: south-western Western Australia, 184-, *J. Drummond* 5, suppl.: 19 (*iso:* BM, CGE, K (3 sheets), MEL, NSW (2 sheets), PERTH).

There are 2 subspecies, one occurring from Tathra National Park south to Badgingarra, the other around Tammin.

1 Flowers 85-115 per head; follicles 18-21 mm long (Tammin) ..... subsp. **speciosa**

1: Flowers 65-75 per head; follicles 24-25 mm long (Tathra-Badgingarra)... subsp. **macrocarpa**

Dryandra speciosa Meisn. subsp. **speciosa**

Flowers 85-115 per head. *Follicles* 18-21 mm long.

Distribution. Occurs near Tammin.

Habitat. Grows in sand in kwongan.

Flowering period. July-August.

Dryandra speciosa subsp. **macrocarpa** A.S. George, subsp. nov.

Ab subsp. *speciosa* capitulis 65-75-floribus et folliculis 24-25 mm longis differt.

Typus: N of Coorow-Greenhead Rd on Willis Rd, Western Australia, 30°00'S, 115°32'E, 5 August 1986, *A.S. George* 16784 (*holo:* PERTH 04228480; *iso:* CANB, K, MEL, NSW).

Flowers 65-75 per head. *Follicles* 24-25 mm long.

Selected collections examined. Tathra National Park, *J. Coleby-Williams* 292 (PERTH); 21 km E of Eneabba on road to Three Springs, *R.J. Hnatiuk* 780133 (PERTH); NW of Dinner Hill, 26 June 1965, *A. Popplewell* (PERTH).

Distribution. Occurs from Tathra National Park to Badgingarra.

Habitat. Grows in sandy loam in kwongan.

Flowering period. July-August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Four.

Etymology. Epithet from the Greek *macros* (large) and *carpos* (a fruit), the follicles being larger than those of subsp. *speciosa.*

Discussion. This subspecies has the same colour varation as subsp. *speciosa*, from pale gold through pink to red.

Ser. 19 *Plumosae*

Dryandra ser. *Plumosae* A.S. George, ser. nov.

Frutices sine lignotubero. Folia pinnatipartita, multilobata. Inflorescentiae axillares, plerumque celatae, inconspicuae; bracteae involucrales tenues, hirsutae vel villosae. Perianthium et pistillum breve, plerumque decurvum.

Typus: *D. plumosa* R. Br.

Shrubs without lignotuber. *Leaves* pinnatipartite with 20-60 lobes each side. *Inflorescence* axillary, sessile or on short branchlet, usually below current season's foliage and hidden; involucral bracts fine, about as long as or shorter than flowers, long-hirsute or villous with hairs up to 5 mm long. *Perianth* short, usually curved, the limb turned downwards before anthesis. *Pistil* curved downwards; pollen presenter not or slightly thickened, ribbed. *Old flowers* ?falling. *Follicles* obliquely ovoid, hairy or almost glabrous, firmly attached. *Seed* obovate; wing not decurrent, not notched.

A series of three species in the Stirling Range-Fitzgerald River region.

Etymology. Named for the type species of the series.

Dryandra plumosa R. Br., Trans. Linn. Soc. London 10: 214 (1810) - *Josephia plumosa* (R. Br.) Poir., Dict. Sci. Nat. 24: 247 (1822). *Type*: Lucky Bay, [E of Esperance, Western Australia], January 1802, *R. Brown* Iter Australiense 3421 (*iso:* BM (2 sheets), K (2 sheets), MEL).

There are two subspecies.

1 Leaves pinnatifid to pinnatipartite; lobe margins (at least the lower margin) concave, prominently recurved; lamina relatively thick ..... subsp. **plumosa**

1: Leaves almost pinnatisect; lobe margins gently convex, slightly recurved; lamina relatively thin ..... subsp. **denticulata**

Dryandra plumosa R. Br. subsp. **plumosa**

Leaves pinnatifid to pinnatipartite; lobe margins (at least the lower margin) concave, prominently recurved; lamina relatively thick. *Follicles* 11-15 mm long, 14-15 mm wide.

Distribution. Occurs from Cape Riche to West Mt Barren and inland to Chillinup and, according to the type, at Lucky Bay but not recorded there again.

Habitat. Grows in sandy loam or clay-loam over gravel and gravelly loam, in kwongan, often also with mallees.

Flowering period. Flowers recorded in most months.

Dryandra plumosa R. Br. subsp. **denticulata** A.S. George, subsp. nov.

Ab *D. plumosa* R. Br. subsp. *plumosa* foliis fere pinnatisectis, lobis fere acutis, marginibus plerumque sinubus late U-formibus, parum recurvis, illis inflorescentiam subtentis minimis denticulatis, et folliculis obovatis 10-12 mm longis 7-8 mm latis, differt.

Typus: NW slope of Bluff Knoll, Western Australia, 12 December 1982, *K.H. Rechinger* 60427 (*holo:* PERTH 01799142).

Leaves thinner in texture than subsp. *plumosa*, almost pinnatisect; lobes almost acute; margins usually gently convex, slightly recurved; leaves subtending inflorescence very small, denticulate. *Follicles* obovate, 10-12 mm long, 7-8 mm wide.

Selected collections examined. Base of Coyanarup, Stirling Range, December 1933, *H. Steedman* (PERTH); Kojaneerup Spring, Stirling Range, *G.J. Keighery* 4921 (PERTH).

Distribution. Endemic in the Stirling Range National Park.

Habitat. Grows in rocky or gravelly sand, in Jarrah-Marri woodland, and in lower montane shrubland.

Flowering period. December.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two. Four collections are known, one of which has a collector's name but no other details.

Etymology. The epithet is from the Latin *denticulatus* (having small teeth), in reference to the minutely denticulate outer involucral bracts.

Discussion. Outermost involucral bracts usually minutely denticulate.

Dryandra pseudoplumosa A.S. George, sp. nov.

Ad *D. plumosam* R. Br. affinis, a qua bracteis involucralibus brevioribus (ad 20 mm longis) crassioribus non filiformibus, floribus per capitulum numerosioris (*c.* 90-100), et folliculis majoribus (17-18 mm longis), praecipue differt.

Typus: 17 km E of Red Gum Pass turnoff on Salt River Rd, Stirling Range National Park, Western Australia, 25 November 1986, *M. Pieroni* 26 (*holo:* PERTH 04225856; *iso:* CANB, NSW, PERTH 04225864).

Shrub to 1.8 m, without lignotuber. *Stems* villous. *Leaves* broadly linear, pinnatipartite; lamina 8-17 cm long, 6-15 mm wide; margins revolute; lobes 15-31 per side, triangular, acute, pungent, the lower edge concave, upper edge convex; petiole 1-2 cm long. *Inflorescence* sessile, axillary, subtended by small 'involucral' leaves; involucral bracts broadly linear, tapering, acute, the longest to 20 mm long, villous, the outermost denticulate; flowers *c.* 90-100 per head. *Perianth* 16-18 mm long, villous-hirsute; limb *c.* 3 mm long, sparsely pubescent and with terminal, long, twisted caducous hairs. *Pistil* 23-25 mm long, strongly incurved, glabrous except for long hairs on ovary; pollen presenter narrowly ellipsoidal, ribbed, 1-1.1 mm long, brown. *Follicles* 1-3 per head, broadly oblong-ovate, gently curved, 17-18 mm long, densely tomentose.

Selected collections examined. Between Yetemerup and Warrungup, 15 Oct. 1902, *A. Morrison* (PERTH); Red Gum Pass, Stirling Range, 7 October 1900, *A. Morrison* (PERTH).

Distribution. Occurs in the Stirling Range National Park and south-east of Ongerup.

Habitat. Grows in sandy gravel in open mallee shrubland and Jarrah-Marri woodland.

Flowering period. November-December.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The epithet is derived from the name of the nearest relative *D. plumosa* with the suffix *pseudo-* to indicate its close resemblance without being the same.

Discussion. Differs from *D. plumosa* in having shorter, thicker involucral bracts without filiform tips, more flowers per head, the pistils bowed ± equally around head, and larger, densely tomentose follicles that are firmly attached.

Dryandra montana C.A. Gardner ex A.S. George, sp. nov.

Ab *D. plumosa* R. Br. et *D. pseudoplumosa* A.S. George foliis coriaceis pinnatisectis lobis tortis marginibus revolutis, et bracteis involucralibus obtusis vel acutis ad 15 mm longis, praecipue differt.

Typus: Bluff Knoll, Stirling Range, Western Australia, 16 Jan. 1966, *K. Newbey* 2226 (*holo:* PERTH 03322726; *iso:* CANB).

Shrub to 2.5 m, without lignotuber. *Stems* rusty-villous. *Leaves* pinnatisect; lamina 8-25 cm long, 6-11 mm wide, hirsute, glabrescent above, closely tomentose below but reticulum evident and midrib prominent; lobes 35-60 each side, obliquely triangular, slightly overlapping at base, strongly curved adaxially and twisted so that underside faces apex of leaf; margins revolute; petiole 10-30 mm long. *Inflorescence* sessile on branchlet 1 or 2 years old; involucral bracts linear to lanceolate, obtuse to acute, villous outside, glabrous inside, the innermost *c.* 15 mm long; flowers 50-60 per head. *Perianth* 17-19 mm long, villous grading to hirsute on claws, yellow; limb 3 mm long, closely pubescent and with a few long hairs towards apex. *Pistil* 18-21 mm long, gently bowed, glabrous except long hairs

at apex of ovary, pale yellow; pollen presenter scarcely thickened, ribbed, 0.8-1 mm long. *Follicles* obliquely obovoid, 9-11 mm long, sculptured, sparsely hairy, dark red-brown.

Selected collection examined. Summit of Bluff Knoll, *F. Lullfitz* 3267 (PERTH).

Distribution. Confined to the higher slopes of Bluff Knoll, Stirling Range National Park.

Habitat. Grows in rocky soil in kwongan.

Flowering period. January.

Conservation status. Dept of Conservation & Land Management Conservation Code: Declared Rare. Almost extinct in the wild. The only known population is infected with *Phytophthora* and may be eliminated within a few years.

Etymology. Named from the Latin *montanus* (of mountains), in reference to the habitat. The epithet was chosen but not published by the late Charles Gardner, Government Botanist of Western Australia 1929-1960.

Discussion. The twisted leaf lobes are distinctive. The leaves are much more coriaceous than those of *D. plumosa* and *D. pseudoplumosa*.

Ser. 20 *Concinnae*

Dryandra ser. *Concinnae* Benth., Fl. Austral. 5: 564, 570 (1870). *Type*: *D. concinna* R. Br.

Dryandra § *Serratae* Meisn. in A.L.P.P. de Candolle, Prodr. 14: 470 (1856). *Type*: *D. serra* R. Br., *lecto* (here chosen).

Tall *shrubs* without lignotuber. *Leaves* serrate or pinnatifid. *Inflorescences* small, on short lateral branchlets or axillary; involucral bracts much shorter than flowers. *Perianth* curved upwards in 1 species, the limb inflexed in 1 and turned downwards in the third. *Pistil* longer than perianth, curved; pollen presenter short, ovoid, cylindrical or conical, smooth or obscurely ribbed. *Old flowers* ?falling. *Follicles* 1 or few, ovoid to elliptic or oblong, oblique. *Seed* with terminal wing.

A series of 3 species near the south coast from Walpole to Albany and in the Stirling Range.

Typification. Meisner included eleven species in his § *Serratae* but they are a heterogeneous group when characters other than foliage are considered. Two are here placed in ser. *Dryandra*, three in ser. *Niveae*, two in the new series *Foliosae*, one in the new series *Tenuifoliae* and the remaining three are retained in ser. *Concinnae*. Since Meisner's diagnosis applies well to all three, *D. serra* is selected as lectotype as the species on which his name was probably based.

Ser. 21 *Obvallatae*

Dryandra ser. *Obvallatae* Benth., Fl. Austral. 5: 564, 576 (1870). *Type*: *D. conferta* Benth., *lecto* (here chosen)

Erect *shrubs*, often columnar, without lignotuber. *Leaves* crowded, linear, pinnatifid, serrate or dentate. *Inflorescence* small, on short lateral branchlet or sessile, hidden or partly so within foliage. *Perianth* straight or downcurved, the limb prominently downcurved before anthesis. *Pistil* prominently downcurved, longer than perianth; pollen presenter small, not thickened. *Old flowers* ?falling or persistent. *Follicles* few, ovoid, obovoid, cuneate or transversely elliptic, hairy. *Seed* with terminal wing.

A series of 5 species.

Typification. Bentham included twelve heterogeneous species in this series; in this treatment these are distributed among eight series, mostly those named by Meisner. Two species included by him - *D. seneciifolia* and *D. conferta* - are retained, and the latter is selected as lectotype since its longer, more pungently-lobed leaves fit the description slightly better.

Dryandra fasciculata A.S. George, sp. nov.

Ab *D. rufistylis* A.S. George stylo flavo, praebitore pollinis rufo, perianthio longiore (18-22 mm longo) in dimidio inferiore sericeo-villoso, et folliculis obovatis, differt. Folia confertissima, dentata.

Typus: 23 miles [*c.* 37 km] E of Harrismith, Western Australia, *c.* 32°57'S, 118°11'E, 28 May 1969, *A.S. George* 9330 (*holo:* PERTH 04228626; *iso:* AD, BRI, CANB, K, MEL, NSW, PERTH 04228634).

Shrub to 1.5 m without lignotuber, columnar. *Stems* villous. *Leaves* crowded with overlapping petioles, linear, decurved, dentate or serrate, acute, pungent, 6-18 cm long, 7-10 mm wide, closely tomentose below; margins recurved; teeth 5-15 each side, to 4 mm long; petiole 1-4 cm long, rusty hirsute. *Inflorescence* sessile or on short branchlet; involucral bracts many, narrow, 25-33 mm long, rusty-villous; flowers 40-60 per head. *Perianth* ± straight with downturned limb, 18-22 mm long, curled-villous in lower half, silky above, creamy yellow; limb 2.5-3 mm long, sparsely hirsute. *Pistil* recurved, 23-31 mm long, glabrous except hirsute ovary, yellow; pollen presenter not thickened, 1.5 mm long, red. *Follicles* obovate, 6-9 mm long, hirsute.

Selected collections examined. 31 km W of Lake Grace, *A.S. George* 16707A, B (CANB, PERTH); 2 km W of Corrigin, *A.S. George* 16750 (CANB, K, MEL, NSW, PERTH), *c.* 13 km SE of Yealering, *A.S. George* 9403 (PERTH).

Distribution. Occurs between Corrigin and Kukerin.

Habitat. Grows in gravel and sand over gravel, in mallee kwongan.

Flowering period. Late May-August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The epithet, from the Latin *fasciculatus* (clustered, in bundles), refers to the crowded leaves and conflorescences.

Discussion. Differs from *D. rufistylis* in the yellow style and red pollen presenter, the larger flowers, the silky-villous lower half of the perianth claws and the obovate follicles. The species may be recognized especially by the numerous, narrow involucral bracts, the crowded overlapping petioles, and the usually dentate leaves.

Dryandra conferta Benth., Fl. Austral. 5: 578 (1870) - *Josephia conferta* (Benth.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: south-western Western Australia, 184-, *J. Drummond* 3: 295 (*lecto* (here chosen): K; *isolecto:* BM, CGE, K, MEL, PERTH).

Typification. There are four sheets of this collection at K, all annotated by Bentham. That selected as lectotype is the best specimen. The species is variable over its wide geographical range. Of all other collections assigned to the species, that which matches the type most closely is *A.S. George* 16754 collected between Quairading and Corrigin (PERTH).

Widespread in inland south-western Western Australia from Miling and Cadoux to the Porongurup Range and east to Bodallin and Mt Holland. Differs from other species of ser. *Obvallatae* in the larger, all-yellow flowers and obliquely obovoid fruit.

There are 2 varieties.

1 Perianth 21-25 mm long; pistil 25-30 mm long; involucral bracts villous ..... var. **conferta**

1: Perianth 15-18 mm long; pistil 16-26 mm long; involucral bracts velvety ..... var. **parva**

Dryandra conferta Benth. var. **conferta**

Shrub to 2.5 m. Involucral bracts villous. *Perianth* 21-25 mm long. *Pistil* 25-30 mm long.

Selected collections examined. 26 km SW of Bodallin, *R. J. Cranfield* 2315 (PERTH); *c.* 22 km SE of Nyabing, *A.S. George* 14289 (CANB, MEL, PERTH); 4 km E of Cadoux, *A.S. George* 16762 (AD, CANB, K, MEL, NSW, PERTH); 9 km SW of Lake Cronin, *K. Newbey* 5810 (MEL, PERTH).

Distribution. Occurs from Miling and Cadoux south to Ongerup and east to Bodallin and Mt Holland.

Habitat. Grows in lateritic loam and sandy loam in kwongan and low open-woodland.

Flowering period. Late June-September.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Four.

Discussion. Flowers with mouse- or honey-like scent. A variable taxon. Typical var. *conferta* has linear leaf teeth and is of spreading habit. The more common form has broad teeth and is columnar. *George* 14289 has a somewhat cuneate follicle. *Newbey* 912 from near Neeralin Pool (PERTH) has narrow leaves mostly less than 9 mm wide. Miling, August 1972, *Seymour* (PERTH) has coarsely lobed leaves.

Dryandra conferta var. **parva** A.S. George, var. nov.

Ab *D. conferta* Benth. var. *conferta* floribus minoribus, bracteis involucralibus velutinioribus, et folliculis obliquioribus (fere transversim obovatis), differt. Perianthium 15-18 mm longum. Pistillum 16-26 mm longum.

Typus: South Fence Rd, 7 km NW of Albany-Lake Grace Rd, SE of Nyabing, Western Australia, *c.* 33°40'S, 118°18'E, 30 July 1986, *A.S. George* 16694 (*holo:* PERTH 03462595; *iso:* CANB, PERTH 03462609).

Perianth 15-18 mm long. *Pistil* 1-26 mm long.

Selected collections examined. N end of Red Gum Pass, Stirling Range National Park, *A.S. George* 16655 (PERTH); S of Ongerup, *M. Pieroni* 33 (PERTH); E end, Porongurup Range, *K. Newbey* 3414 (CANB, NSW, PERTH).

Distribution. Occurs from the Nyabing area to the western Stirling Range and south of Ongerup, with a record at the east end of the Porongurup Range.

Habitat. Grows in gravelly clay, clay loam and sandy loam, in kwongan and tall shrubland.

Flowering period. June-August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The varietal epithet is from the Latin *parvus* (small) and refers to the flowers being smaller than those of var. *conferta*.

Discussion. Differs from var. *conferta* in the smaller flowers, more velvety involucral bracts, and more oblique (almost transversely obovate) follicles. Although *D. conferta* is very variable, some southern populations appear to have consistently smaller flowers.

Dryandra columnaris A.S. George, sp. nov.

Ab *D. seneciifolia* R. Br. habitu elatiore (ad 2 m alto), foliorum lobis brevioribus numerosioris (5-18 in quoque margine), bractearum involucralium pilis glandularibus, perianthii pilis crispis, et folliculis majoribus (10-12 mm longis), differt.

Typus: Boyagin Nature Reserve, SW of Brookton, Western Australia, 29 May 1969, *A.S. George* 9354 (*holo:* PERTH 04228669; *iso:* CANB, MEL, NSW, PERTH 04228677).

Illustration. R.M. Sainsbury, Field Guide Dryandra 87 (1985), as *D. seneciifolia.*

Columnar *shrub* to 2 m, without lignotuber. *Stems* tomentose and hirsute. *Leaves* linear, pinnatifid, mucronate; lamina 5-15 cm long, 3-15 mm wide, white-tomentose below and with long sparse hairs on midrib, sparsely hirsute and pubescent above; margins revolute, with 5-18 triangular-falcate teeth each side to 8 mm long; petiole to 4 cm long, hirsute and tomentose. *Inflorescence* almost

sessile, surrounded by leaves; involucral bracts linear-subulate, to 2 cm long, glandular-pubescent, the lower margins hirsute; flowers 25-35 per head. *Perianth* curved downwards, 11-14 mm long (lower flowers), 16 mm long (upper flowers), pale yellow to purple with grey brown limb, villous with curled hairs above base, sparser above; limb 2-2.5 mm long, sparsely hirsute. *Pistil* curved up then down, 13-16 mm or 19-20 mm long, glabrous except ovary; pollen presenter 1.2 mm long. *Follicles* 1 or 2, broadly obovate-cuneate, 10-12 mm long, pubescent.

Selected collections examined. Dryandra, *A.S. George* 16623 (CBG, PERTH); Tutanning Nature Reserve, *A.S. George* 7786 (PERTH).

Distribution. Localized in a few areas between Brookton and Narrogin.

Habitat. Grows in lateritic soil in low woodland and kwongan.

Flowering period. May-June.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The epithet is Latin for columnar or column-like, in reference to the habit.

Discussion. Seedling leaves are linear and entire. Differs from *D. seneciifolia* in the taller habit, in having shorter, more numerous leaf lobes, in the glandular hairs of the involucral bracts, the curled hairs of the perianth and the larger fruit.

Dryandra platycarpa A.S. George, sp. nov.

Ab speciebus aliis ser. *Obvallatae* foliis pinnatipartitis, bracteis involucralibus brevibus (ad 12 mm longis), floribus parvis (perianthio 13-16 mm longo) cremeis et brunneis, et folliculis transverse ovatis 11-13 mm latis, differt.

Typus: junction of Coorow-Greenhead Rd and Tootbardi Rd, Alexander Morrison National Park, Western Australia, 30°04'S, 115°31'E, 5 August 1986, *A.S. George* 16781 (*holo:* PERTH 04110404; *iso:* CANB, MEL, PERTH 04110412).

Shrub to 80 cm with 1-several columnar branches, without lignotuber. *Stems* villous and tomentose. *Leaves* broadly linear, pinnatipartite, spreading, acute to obtuse, pungent, 4-12 cm long, 6-17 mm wide, closely tomentose below; margins revolute; lobes 10-25 each side, subulate to triangular, to 8 mm long, pungent; petiole usually 2-6 mm long, villous, glabrescent. *Inflorescence* on short branchlet or sessile; involucral bracts many, linear, mostly to 12 mm long, silky-villous with white hairs; flowers 60-75 per head. *Perianth* straight to curved with downturned limb, 13-16 mm long, curled-tomentose in lower half, silky-villous above, cream; limb 2.5 mm long, pilose, gold or brown. *Pistil* recurved, 16-19 mm long, glabrous except silky ovary, cream; pollen presenter not thickened, 1 mm long, green or cream. *Follicles* transversely ovate, 9 mm long, 11-13 mm wide, sparsely pilose.

Selected collections examined. *c.* 37 km NNE of Eneabba on First North Rd, *A.S. George* 16798 (CANB, PERTH); 10 km W of Mogumber township, *A.S. George* 7766 (CANB, MEL, NSW, PERTH); Dinner Hill, Aug. 1962, *F.W. Humphreys* (PERTH); *c.* 16 km W of Winchester, *A.C. Beauglehole* 12090 (PERTH).

Distribution. Occurs from north of Eneabba to Mogumber.

Habitat. Grows in deep sand or gravelly sand in low or tall kwongan.

Flowering period. May-July.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. Epithet from the Greek *platys* (wide, flat) and *carpos* (a fruit), in reference to the follicles.

Discussion. The only species of ser. *Obvallatae* in the kwongan north of Perth. May be recognized by the pinnatipartite leaves, short involucral bracts, small cream and brown flowers and broad follicles. Plants from the Mogumber area have broader leaf lobes than those further north. There is some variation in size of flowers.

Dryandra rufistylis A.S. George, sp. nov.

Ad *D. confertam* Benth. affinis, a qua perianthio villoso, stylo rufo et folliculis parvis (7-9 mm longis), differt; ab *D. seneciifolia* R. Br. foliis serratis, perianthio cremeo-flavo et stylo rufo differt.

Typus: *c.* 8 miles [c. 13 km] SW of Woodanilling, Western Australia, 33°37'S, 117°20'E, 3 August 1969, *A.S. George* 9498 (*holo:* PERTH 03262294; *iso:* CANB, K, MEL, NSW, PERTH 03262308).

Shrub to 1.5 m, columnar, without lignotuber. *Leaves* linear, serrate, recurved, acute, pungent, 5-15 cm long, 4-10 mm wide, closely tomentose below; margins slightly recurved; teeth 5-10 each side, to 5 mm long; petiole to 15 mm long, hirsute. *Inflorescence* sessile; leaves passing into involucral bracts; bracts subulate, numerous, to 20 mm long, rusty-villous; flowers 35-40 per head. *Perianth* ± straight with limb downturned before anthesis, 14-18 mm long, woolly, creamy yellow with yellow or pink-brown limb; limb 2.5 mm long, sparsely hirsute. *Pistil* downcurved, 18-22 mm long, glabrous except hirsute ovary, red with green pollen presenter; pollen presenter not or slightly enlarged, *c.* 1 mm long, obscurely ribbed. *Follicles* ovoid with flattened apex, erect, 7-9 mm long, sparsely hirsute.

Selected collections examined. 47 km N of Nyabing, *A.S. George* 16701 (PERTH); River Rd, NE of Woodanilling, *A.S. George* 16631 (CANB, MEL, PERTH).

Distribution. Occurs from the Woodanilling district east to Nyabing and north towards Tarin Rock.

Habitat. Grows in gravelly loam, in kwongan and eucalypt low open woodland.

Flowering period. July-August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. Named from the Latin *rufus* (reddish) and *stylus* (style), the red style being a distinctive feature of the species.

Discussion. The red style is distinctive. Distinguished from *D. seneciifolia* by the serrate leaves and different flower colours. Resembles *D. conferta* but differs especially in the woolly perianth, red style and small ovoid fruit, and *D. columnaris* from which it is separated by the serrate leaves. A population near Corrigin (*A.S. George* 16750) has slightly larger flowers (perianth 19-20 mm long, pistil 23-24 mm long), a cream style and more spreading leaf teeth than typical plants. It is placed tentatively with this species.

Ser. 22 *Pectinatae*

Dryandra ser. *Pectinatae* (Meisn.) A.S. George, stat. nov.

Dryandra § *Pectinatae* Meisn. in A.L.P.P. de Candolle, Prodr. 14: 475 (1856). *Type*: *D. nana* Meisn., *lecto* (here chosen).

Dwarf *shrubs* with small lignotuber. *Leaves* deeply pinnatifid. *Inflorescence* terminal; involucral bracts much shorter than flowers. *Perianth* straight except limb reflexing before anthesis, flared widely at apex of basal tube. *Pistil* curved, much longer than perianth; pollen presenter markedly swollen, not ribbed. *Old flowers* persistent. *Follicles* broadly obovate, sparsely hairy, usually remaining closed until burnt. *Seed* body basal; wing not decurrent, shortly notched.

A monotypic series of the kwongan north of Perth, characterized by the very long pistil, clavate pollen presenter and perianth flaring widely above the basal tube.

Typification. Meisner included six species in this series. As with most of his series, which are based only on the leaves, these are now considered heterogeneous and in this treatment are placed in five series, three in other previously named ones, the others in new ones described here. The description of the leaf lobes as linear, parallel, several times longer than wide, is slightly more fitting to *D. nana* and *D. fraseri* than to *D. serratuloides*, and *D. nana* is selected as Meisner placed it before *D. fraseri* in his arrangement.

Ser. 23 *Acuminatae*

Dryandra ser. *Acuminatae* A.S. George, ser. nov.

Frutices prostrati cum lignotubere vel caulibus subterraneis. Folia pinnatipartita, interdum lobis etiam pinnatipartitis. Inflorescentia terminalis; receptaculum prominenter conicum; bracteae involucrales multae, lanceolatae, longe acuminatae. Perianthium rectum, sparsim hirsutum pilis patentibus viscidis; limbus antea anthesin inflexus. Pistillum incurvum; praebitor pollinis ad basin parum tumidus, costatus. Flores veteres persistentes. Folliculi pauci, valde affixi, oblique obovati.

Typus: *D. preissii* Meisn.

Prostrate *shrubs*, with lignotuber or underground stems. *Leaves* pinnatipartite, some lobes again pinnatipartite; margins revolute. *Inflorescence* terminal; receptacle prominently conical; involucral bracts many, lanceolate, long-acuminate. *Perianth* straight, sparsely hirsute with spreading sticky

hairs; limb inflexed before anthesis. *Pistil* incurved; pollen presenter slightly swollen at base, ribbed. *Old flowers* persistent. *Follicles* several, firmly attached, obliquely obovate. *Seed* wing ?terminal.

A monotypic series, characterized by the bipinnatipartite leaves, many acuminate involucral bracts and sticky perianth hairs.

Etymology. Series name from the Latin *acuminatus* (drawn to a fine point), in reference to the involucral bracts.

Ser. 24 *Niveae*

Dryandra ser. *Niveae* Benth., Fl. Austral. 5: 564, 574 (1870). *Type*: *D. nivea* (Labill.) R. Br.

Shrubs with prostrate or short, erect divaricately branched stems, with or without lignotuber. *Leaves* linear, pinnatifid, pinnatipartite or pinnatisect. *Inflorescence* terminal, sometimes subtended by new branchlets; involucral bracts shorter than flowers, flat; receptacle markedly convex; flowers arranged so that at anthesis the styles curve inwards leaving a prominent central hole; floral bracts linear, obtuse, variously hairy and with apical papillae or curled hairs. *Perianth* straight, the limb inflexed before anthesis. *Pistil* of outer flowers much longer than inner, strongly incurved. *Old flowers* persistent. *Follicles* obovate, sometimes markedly narrowed towards base, loosely attached. *Seed* with terminal wing.

A closely knit series of 6 species widespread between Geraldton, Cape Leeuwin and Israelite Bay and inland to Corrigin. One of the most difficult series taxonomically: the floral and fruit morphology are remarkably uniform, species being separated largely on the basis of habit and leaf morphology. For many years the name *D. nivea* has been used in a broad sense for the whole group, but it has become evident that several taxa should be recognized. Recently the early names *D. arctotidis* R. Br., *D. brownii* Meisn., *D. stenoprion* Meisn. and *D. tortifolia* Meisn. have been brought back into use. *Dryandra lindleyana* Meisn. is now resurrected for a widespread, variable species in which five subspecies are recognized, and one new species is described. The series deserves a great deal more study.

Dryandra cypholoba A.S. George, sp. nov.

Ab *D. lindleyana* Meisn. lobis foliorum majoribus ad apicem arcte recurvis differt. Lamina folii 12-20 cm longa, 8-20 mm lata, lobis 25-40 in quoque margine.

Typus: junction of Coorow-Greenhead Rd and Tootbardi Rd, Western Australia, 30°04'S, 115°31'E, 5 August 1986, *A.S. George* 16777 (*holo:* PERTH 04110641; *iso:* AD, CANB, K, MEL, NSW, PERTH 04110668).

Shrub with short underground fire-tolerant stems. *Leaves* pinnatipartite, the lobes usually markedly recurved; lamina 12-20 cm long, 8-20 mm wide; lobes 25-40 each side, broadly triangular, obtuse to acute, the upper margin usually incurved to apex; petiole 1-4 cm long, pubescent, glabrescent. *Inflorescence* terminal, often subtended by hirsute dwarf leaf-bracts; involucral bracts narrowly ovate-lanceolate, acute, passing to broadly linear and obtuse, rusty-pubescent all over, green and orange-brown; flowers 55-60 per head. *Perianth* 27-37 mm long, shortly appressed-hirsute above

base, passing to appressed-pubescent claws, pale pinkish brown; limb 3–4 mm long, hirsute with shaggy apex. *Pistil* 41-47 mm long, lemon yellow; pollen presenter narrow, 1.3-1.5 mm long. *Follicles* obovate, 13-16 mm long, glabrous except apical and marginal hairs.

Selected collections examined. Corner of Beekeeper Rd and First North Rd, *A.S. George* 16796 (PERTH); 14 km W of Arrino on Richardson Rd, *A.S. George* 17010 (PERTH); 8 km W of Willis Rd on Eneabba-Carnamah Rd, *E.A. Griffin* 3494 (PERTH).

Distribution. Occurs from west of Arrino south to Alexander Morrison National Park.

Habitat. Grows in sand and gravelly loam, in kwongan with scattered *Eucalyptus todtiana* or in thick scrub.

Flowering period. August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The epithet is from the Greek *kyphos* (bent, humped) and *lobos* (a lobe), the leaf lobes being prominently recurved and hump-like.

Discussion. Differs from *D. lindleyana* especially in the leaves having large, coarse lobes that are usually recurved towards the apex giving the leaf a rolled appearance. The collection *A.C. Beauglehole* 12135 from *c.* 33 km W of Winchester (PERTH) has broad sinuses and fewer leaf lobes.

Dryandra lindleyana Meisn., in J.G.C. Lehmann (ed.), Pl. Preiss. 1: 598 (1845). *Type*: near 'Pointwater' [probably Point Walter], Swan River, Perth, [Western Australia], 17 July 1839, *L. Preiss* 511 (*holo:* NY, *iso:* BM, Fl, G, MEL, P).

Discussion. This species, which has fire-tolerant underground stems, includes taxa that for many years have been included within a broadly circumscribed *D. nivea.* The type of the latter is from near Esperance Bay and is non-lignotuberous. *Dryandra lindleyana* is a highly variable species with 5 subspecies here recognized (one with two varieties).

1 Leaf lobes oblong or linear (central and southern forests) ..... subsp. **sylvestris**

1: Leaf lobes essentially triangular

2 Leaves divided almost or quite to midrib

3 Leaf lobes ± regularly triangular, although upper margin usually shorter than lower margin

4 Leaves 3-10 mm wide; lobes 30-60 each side of leaf (Mt Adams to Cape Naturaliste) ..... subsp. **lindleyana**

4: Leaves 2-3 mm wide; lobes 60-80 each side of leaf (Watheroo National Park to Moora) ..... subsp. **pollosta**

3: Leaf lobes with lower (basal) margin shallowly S-shaped or concave, the apex often slightly twisted so that lower margin is more recurved than upper (Arrowsmith River to Badgingarra) ..... subsp. **media**

2: Leaves divided ½ to ¾ to midrib (central wheatbelt) ..... subsp. **agricola**

Dryandra lindleyana Meisn. subsp. **lindleyana**

Stems prostrate to erect, to 45 cm long. *Leaf* lamina 10-20 cm long, 3-10 mm wide; margins recurved to revolute; lobes 30-60 each side, triangular with the upper side shorter, obtuse; sinuses V-shaped, 2-5 mm across; petiole 1-3 cm long. *Inflorescence* subtended by normal leaves; involucral bracts to 15-23 mm long, glabrous to densely pubescent, densely ciliate; flowers 50-70 per head. *Perianth* 22-35 mm long. *Pistil* 24-53 mm long; pollen presenter scarcely thickened at base, 1-1.3 mm long.

A very variable subspecies in habit and leaf form. Two varieties are recognized.

1 Plant with most stems procumbent, the aerial part less than 10 cm long ..... var. **lindleyana**

1: Plant with aerial stems to 45 cm tall; Darling Plateau ..... var. **mellicula**

Dryandra lindleyana Meisn. subsp. **lindleyana** var. **lindleyana** - *D. nivea* var. *subevenia* Meisn., in A.L.P.P. de Candolle, Prodr. 14: 472 (1856). *Type*: locality not cited, south-western Western Australia, date not cited, *L. Preiss* 508 (*lecto* (here chosen): NY).

Typification. Of the four collections cited in the protologue, *L. Preiss* 508 and *J. Drummond* 1: 640 (BM, K, MEL) are *D. lindleyana* subsp. *lindleyana* var. *lindleyana*, *J. Drummond* 4: 313 (BM, K (2 sheets), MEL) is *D. nivea* subsp. *nivea*, and *J. Drummond* 5: 419 (BM, K, MEL) is *D. brownii*. The Preiss collection is selected as the first listed by Meisner, and because most types of his other new taxa in Proteaceae are at NY; no specimen annotated by him has been found.

Stems prostrate, mostly underground. *Leaf* lamina 10-20 cm long, 3-8 mm wide.

Distribution. Occurs between Geraldton and Cape Naturaliste.

Habitat. Grows in sand, often over limestone, sometimes over laterite in kwongan and low woodland, and on the Darling Scarp and Plateau in lateritic or granitic soil in shrubland and open forest.

Flowering period. July-August.

Discussion. Variable in leaf length and width and in the size of the lobes. A collection 'between Moora and Jurien', *T.G. Hartley* 13924 (PERTH) has a large inflorescence (involucral bracts to 30 mm long, perianth 35 mm, pistil 53 mm).

Dryandra lindleyana subsp. **lindleyana** var. **mellicula** A.S. George, var. nov.

Ab *D. lindleyana* Meisn. var. *lindleyana* caulibus aereis ad 45 cm altis et foliorum lobis majoribus (lamina ad 10 mm lata) differt.

Typus: Lower Chittering, Western Australia, 3 September 1994, *A.S. George* 17210 (*holo:* PERTH 04228766; *iso:* CANB, K, NSW, PERTH 04228774).

Stems usually erect, to 45 cm long. *Leaf* lamina 10-15 cm long, 5-10 mm wide.

Selected collections examined. Barrington Quarry, *H. Demarz* 7487 (PERTH); Red Hill, Toodyay Rd, *R.A. Saffrey* 121 (PERTH); Helena Valley, *J. Seabrook* 75 (PERTH).

Distribution. Common on the Darling Plateau and along the Darling Scarp east of Perth, extending south to Cape Naturaliste.

Habitat. Grows in lateritic gravel in Jarrah-Marri forest, occasionally in sand in woodland.

Flowering period. July-September.

Conservation status. Not endangered.

Etymology. Epithet from the Latin *melliculus* (a little honey), the inflorescences of this group of dryandras being popularly referred to as 'honeypots' on account of their shape and nectar production.

Discussion. Differs from var. *lindleyana* mainly in the erect stems and more coarsely lobed leaves; sometimes occurs close to var. *lindleyana* but flowers earlier.

Dryandra lindleyana subsp. **media** A.S. George, subsp. nov.

Ad *D. lindleyanam* Meisn. subsp. *lindleyanam* affinis, a qua lobis foliorum grossioribus differt. Folii lamina 15-20 cm longa, 7-10 mm lata, lobis 25-40 in quoque margine

Typus: 5.6 km S of Eneabba on Brand Hwy, Western Australia, 29°52'S, 115°15'E, 6 August 1993, *A.S. George* 16808 (*holo:* PERTH 04110625; *iso:* CANB, MEL, NSW, PERTH 04110633).

Stems short, mostly underground. *Leaves* broadly linear, pinnatipartite; lamina 15-20 cm long, 7-10 mm wide; lobes 25-40 each side, broadly triangular, obtuse, the lower margin usually shallowly S-shaped with its apical part strongly recurved and thus appearing twisted; sinuses 3-10 mm across; petiole 1-3 cm long. *Inflorescence* terminal; involucral bracts to 20-25 mm long, rusty; flowers 50-65 per head. *Perianth* 26-30 mm long, cream-pink. *Pistil* 35-40 mm long, cream at base, pink above; pollen presenter swollen at base, 1.3 mm long, green.

Selected collections examined. *c.* 40 km W of Three Springs, *C.A. Gardner* 9142 (PERTH); 7 km S of Eneabba, *E.A. Griffin* 954 (PERTH); Brand Hwy, N of Arrowsmith River, *E.A. Griffin* 3500 (PERTH).

Distribution. Occurs between the Arrowsmith River, Badgingarra and Mt Lesueur.

Habitat. Grows in deep sand or sandstone-gravel in kwongan.

Flowering period. August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Three.

Etymology. The Latin epithet refers to the intermediate morphology of the subspecies.

Discussion. This is similar to typical *D. lindleyana* but the leaf lobes are larger giving the plant a coarser aspect. There is a resemblance to *D. cypholoba* but that taxon has a very distinctive appearance from the strongly recurved character of the leaf lobes.

Dryandra lindleyana subsp. **pollosta** A.S. George, subsp. nov.

Ab subspeciebus aliis foliis tenuibus differt. Folii lamina 13-20 cm longa, 2-3 mm lata, lobis 60-80 in quoque margine.

Typus: just W of cemetery, Moora, Western Australia, 30°38'S, 115°59'E, 9 August 1993, *A.S. George* 17002 (*holo:* PERTH 04228642; *iso:* CANB, K, NSW).

Stems mostly underground, forming clumps to 1 m across. *Leaves* pinnatipartite, ± flat; lamina 13-20 cm long, 2-3 mm wide; lobes 60-80 each side, obliquely triangular, obtuse, white-tomentose below; sinuses oblique, V-U-shaped, 1-3 mm across; petiole 1-4 cm long, tomentose, glabrescent. *Inflorescence* terminal; involucral bracts lanceolate (outer) to broadly linear and obtuse (inner), appressed-pubescent to glabrous except ciliate margins, the innermost 15-22 mm long; flowers 35-45 per head. *Perianth* 25 (inner) to 30 (outer) mm long. *Pistil* 32-37 mm long, pale maroon; pollen presenter slightly thickened, 1 mm long.

Selected collections examined. Reserve 12276, between Dandaragan and Moora, *E.A. Griffin* 4881 (PERTH); Brand Hwy, N of Red Gully Rd, *B.J. Keighery* 243B (PERTH); Mortlock Flora Reserve, W of Wongan Hills, *K.F. Kenneally* 5371 (PERTH).

Distribution. Occurs from Moore River National Park to Moora and Watheroo National Park, with a record west of Wongan Hills.

Habitat. Grows in sand, in banksia woodland and open shrubland.

Flowering period. August.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Two.

Etymology. The varietal epithet is from the Greek *pollostos* (smallest, least), this having the smallest leaf lobes of any *Dryandra.*

Discussion. Distinguished from other subspecies by the very fine leaves but grades into subsp. *lindleyana.*

Dryandra lindleyana subsp. **sylvestris** A.S. George, subsp. nov.

Ab subspeciebus aliis foliis brevioribus lobis paucioribus longioribus oblongis, praecipue differt. Lamina folii 6-16 cm longa, 10-20 mm lata; lobi 10-35 in quoque margine.

Typus: E of Mayanup, SE of Boyup Brook, Western Australia, 22 September 1972, *A.S. George* 11621 (*holo*: PERTH 04228952; *iso:* CANB).

Shrub with short underground fire-tolerant stems. *Leaves* broadly linear, almost pinnatisect; lamina 6-16 cm long, 10-20 mm wide; lobes 10-35 each side, obliquely oblong to narrowly triangular, acute, pungent, the margins convex towards apex, almost flat; sinuses obliquely V-shaped to narrowly U-shaped; petiole 5-12 mm long. *Inflorescence* subtended by a few normal leaves; involucral bracts to 20-24 mm long; flowers 30-40 per head. *Perianth* 22-25 mm long. *Pistil* 30-37 mm long, glabrous; pollen presenter slightly swollen at base, 1 mm long.

Selected collections examined. Yornup, *E.J. Croxford* 4471 (PERTH); near North Bannister, *K. Newbey* 2465 (PERTH); Quindanning-Harvey road, *S. Paust* 952 (PERTH).

Distribution. Widespread on the Darling Plateau of the lower South-West.

Habitat. Grows in lateritic soil in Jarrah-Marri forest.

Flowering period. September-October.

Conservation status. Not endangered.

Etymology. The Latin *sylvestris* (of woods or forests) refers to the typical habitat of the subspecies.

Discussion. Differs from the other subspecies mainly in the short leaves with fewer, longer, oblong lobes, and from *D. brownii* in the fire-tolerant habit and short leaves. Some collections have larger flowers, e.g. N Dinninup Reserve, *E.M. Bennett* 2037 and North Bannister, *K. Newbey* 2465 (both at PERTH), with the perianth 35 mm long and pistil 43 mm.

Dryandra lindleyana subsp. **agricola** A.S. George, subsp. nov.

Ab subspeciebus aliis foliis pinnatipartitis ad dimidium laminae divisis, glaucis, et folliculis minoribus (7-10 mm longis), differt. Flores flavi.

Typus: near Jubuk, 60 km E of Brookton, Western Australia, 32°21'S, 117°45'E, 8 October 1994, *A.S. George* 17219 (*holo:* PERTH 04228456; *iso:* AD, CANB, K, MEL, NSW, PERTH 04228464).

Stems mostly underground, short. *Leaves* broadly linear, pinnatipartite, glaucous, densely hirsute when young; lamina 10-17 cm long, 8-13 mm wide, white below; lobes 15-30 each side, ± triangular, ± flat; margins ± equally recurved to revolute; sinuses obliquely curved-V-shaped, 3-8 mm across; petiole 2-4 cm long. *Inflorescence* with subtending dwarf hirsute leaf-bracts; involucral bracts oblong to broadly linear, appressed-pubescent and densely ciliate, the innermost 18-20 mm long. *Perianth* *c.* 20 mm long, pale yellow. *Pistil* 33-35 mm long, pale yellow; pollen presenter not enlarged, 0.8 mm long.

Selected collections examined. SSE of Corrigin, *A.S. George* 14363 (PERTH); between Jurakine Pool and Yenyenning Lake, NE of Brookton, *R.J. Hnatiuk* 791040 (PERTH); NE of Traysurin, *K. Newbey* 2487 (PERTH).

Distribution. Occurs between Corrigin and Traysurin in the central wheatbelt.

Habitat. Grows in sandy loam in kwongan.

Flowering period. September.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One. Only a few small populations are known.

Etymology. The epithet is from the Latin *ager* (a field) and the suffix *-cola* (growing in), in reference to the occurrence in central agricultural region of the South-West.

Discussion. The broad leaves divided *c.* half-way to midrib, always-yellow flowers and small fruit are distinctive.

Dryandra nivea (Labill.) R. Br., Trans. Linn. Soc. London 10: 214 (1810) - *Banksia nivea* Labill., Voy. 411, t. 24 (1800) - *Josephia rachidifolia* Knight, Cult. Prot. 111 (1809), *nom. illeg.* - *D. nivea* var. *adscendens* Endl., Gen. Pl. 4(2): 89 (1848), *nom illeg.* - *Josephia nivea* (Labill.) Kuntze, Revis. Gen. Pl. 2: 578 (1891) - *D. nivea* var. *venosa* Meisn., in A.L.P.P. de Candolle, Prodr. 14: 472 (1856), *nom. illeg.* *Type*: le Grand Bay [Esperance Bay, Western Australia], 11–18 December 1792, *J.J.H. de Labillardière* (*lecto* (here chosen): FI).

Rounded *shrub* to 1.3 m high and wide, without lignotuber, dichotomously much-branched. *Leaves* linear, pinnatipartite, silky-tomentose above but glabrescent, the lobes white-tomentose below; lamina 20-45 cm long, 3-10 mm wide; lobes 45-80 each side, ± triangular, rounded-obtuse; margins shortly revolute; petiole 1-3 cm long. *Inflorescence* terminal but usually subtended by new branches; involucral bracts oblong, broadened upwards, to 18-22 mm long, appressed-hirsute or almost glabrous except ciliate margins; flowers *c.* 70-90 per head. *Perianth* 25-38 mm long, hirsute in lower half, then appressed-pubescent; limb 2-3 mm long, hirsute. *Pistil* 32-45 mm long, glabrous, cream or red; pollen presenter slightly thickened at base, 0.7-1.5 mm long. *Follicles* obovate, ± acute at base, 9-13 mm long, almost glabrous.

Typification. There is one sheet at FI, ex Herbarium Webbianum, with two Webbian labels - one 'ex Herb. Desfontaines', the other 'ex Herb. Labillardière' - and it is not possible to match the labels to the specimens. The largest specimen is selected as lectotype, being the major part of a whole plant including part of the root system showing that it is non-lignotuberous.

Distribution. Widespread through south-western Western Australia from Lake Indoon to Ongerup and east almost to Israelite Bay, with outliers in the extreme south-west.

Discussion. Distinguished from most species of ser. *Niveae* in the non-lignotuberous, much-branched habit, and from the non-lignotuberous *D. brownii* by the narrower leaves with triangular lobes. The leaves are typically longer than those of related species.

There are 2 subspecies.

1 Pistil 32-40 mm long; leaf lamina up to 35 cm long, 3-8 mm wide (Eneabba to Cape Arid, in dry soil) ..... subsp. **nivea**

1: Pistil 41-45 mm long; leaf lamina up to 45 cm long, 7-10 mm wide (winter-wet flats near Busselton and the Scott River) ..... subsp. **uliginosa**

Dryandra nivea (Labill.) R. Br. subsp. **nivea**

Shrub less than 1 m tall. *Leaf* lamina usually 20-35 cm long, 3-8 mm wide. *Pistil* 32-40 mm long.

Distribution. Widespread from Lake Indoon to Ongerup and east almost to Israelite Bay.

Habitat. Grows in lateritic gravel or sandy-loam, in woodland and kwongan.

Flowering period. Usually August-September.

Discussion. Pieroni 94/2 from Morangup Nature Reserve (PERTH) has almost glabrous involucral bracts, *c.* 55 flowers per head, red styles, and is unusual in flowering in April. Illustrated by R.M. Sainsbury, *Field Guide Dryandra* 5 (1985) as *D. arctotidis*.

Dryandra nivea subsp. **uliginosa** A.S. George, subsp. nov.

Ab subsp. *nivea* habitu majore (ad 1.5 m alto), foliis grossius lobatis, et pistillo longiore, differt. Foliorum lamina ad 45 cm longa, 7-10 mm lata. Pistillum 41-45 mm longum. In paludibus hiemalibus habitat.

Typus: Governor Broome Rd, Scott River plain, Western Australia, 34°15'S 115°17'E, 21 October 1993, *A.S. George* 17117 (*holo:* PERTH 04228936; *iso:* CANB, K, NSW, PERTH 04228944).

Dense *shrub* to 1.5 m tall. *Leaves* deeply pinnatipartite; lamina 20-45 cm long, 7-10 mm wide; lobes 60-80 each side, obliquely triangular, obtuse, the upper margin convex, lower convex or shallowly S-shaped; sinuses curved-V-shaped, 2-5 mm across, the margins contiguous in lower half; petiole 1-3 cm long. *Inflorescence* terminal; involucral bracts ovate to oblong, sparsely pubescent to glabrous except ciliate margins, the innermost ones to 20 mm long; receptacle rounded; flowers *c.* 70 per head; floral bracts linear, obtuse. 4–5 mm long, white-hirsute, the apex papillose. *Perianth* 29-38 mm long, hirsute; limb 3 mm long, coarsely hirsute. *Pistil* 41-45 mm long, glabrous; pollen presenter not thickened, 0.7-0.9 mm long.

Selected collections examined. c. 20 km SSE of Busselton, *G.J. Keighery* 6622 (PERTH); Tutunup, *R.D. Royce* 5751 (PERTH).

Distribution. Occurs to the east of Busselton and on the Scott River plain.

Habitat. Grows on winter-wet flats, in clay over laterite in thick scrub.

Flowering period. September.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority One. The areas are subject to clearing.

Etymology. Named from the Latin *uliginosus* (full of moisture, hence marshy), in reference to the winter-wet habitat.

Discussion. Generally a larger plant with more coarsely lobed leaves, and occurring in a winter-wet habitat.

Subg. 2. *Hemiclidia*

Dryandra subg. *Hemiclidia* (R. Br.) A.S. George, comb. et stat. nov.

Hemiclidia R. Br., Suppl. Prodr. Fl. Nov. Holl. 40 (1830). *Type*: *H. baxteri* R. Br. = *Dryandra falcata* R. Br.

Erect *shrubs* without lignotuber. *Leaves* cuneate, serrate. *Inflorescence* terminal or on short lateral branchlet, conspicuous. *Perianth* straight. *Pistil* curved, longer than perianth; pollen presenter narrow, not ribbed. *Old flowers* ?persistent. *Follicles* ± cartilaginous, ovoid, hairy, usually remaining closed until burnt. *Seed* elliptic, not winged.

A subgenus of 2 species, one in the kwongan north of Perth, the other in southern districts from the Stirling Range to Israelite Bay. The very small, rather soft fruit is distinctive.

Dryandra glauca A.S. George, sp. nov.

Ab *D. falcata* R. Br. foliis glaucis, floribus pallidis et folliculis majoribus (*c.* 7 mm longis), praecipue differt.

Typus: Watheroo Rd, Watheroo National Park, Western Australia, 30°19'S, 115°47'E, 5 August 1986, *A.S. George* 16773 (*holo:* PERTH 03324885; *iso:* CANB, K).

Shrub to 1.5 m, without lignotuber. *Stems* tomentose and hirsute. *Leaves* cuneate, truncate, shortly mucronate, ± glaucous; lamina 4.5-7.5 cm long, 2-3.5 cm wide; margins thickened but flat, deeply dentate with narrowly triangular lobes with subulate pungent tips, the apical ones directed forwards; petiole 5-10 mm long, flat, tomentose. *Inflorescence* on short leafy branchlet; involucral bracts broadly linear, tapering, acute, silky, the outermost ones recurved and ± glabrescent, pale rusty, inner ones 12-18 mm long; flowers *c.* 80-110 per head. *Perianth* 28-34 mm long, hirsute, pale yellow; limb 2.5-3.2 mm long, keeled, glabrous. *Pistil* 30-35 mm long, glabrous; pollen presenter slightly thickened, smooth, 1.2-1.7 mm long, cream. *Follicles* ovoid, 7 mm long, shortly pubescent, the margins densely long-hirsute.

Selected collections examined. First North Road, 5.6 km N of Three Springs-Eneabba road, *A.S. George* 16802 (PERTH); 27 km S of Eneabba, *K.H. Rechinger* 58279 (PERTH); Chatfield Clarke Rd, Alexander Morrison National Park, *E.D. Kabay* 53 (PERTH).

Distribution. Occurs from north-east of Eneabba and Tathra National Park south to Badgingarra.

Habitat. Grows on lateritic rises in kwongan.

Flowering period. July-October.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Four.

Etymology. Named from the Latin *glaucus* (having a bluish grey bloom), in reference to the leaves.

Discussion. Closely related to *D. falcata* but differs in the usually glaucous leaves, paler flowers and slightly larger follicles. The two are quite disjunct geographically.

Subg. 3. *Diplophragma*

Dryandra subg. *Diplophragma* (R. Br.) A.S. George, stat. nov.

Dryandra sect. *Diplophragma* R. Br., Suppl. Prodr. Fl. Nov. Holl. 37 (1830). *Type*: *D. bipinnatifida* R. Br.

Dwarf *shrubs* with underground stems. *Leaves* bipinnatifid. *Inflorescence* terminal, often beyond leaves and 'erupting' from soil, large; involucal bracts as long as or exceeding flowers. *Perianth* straight to gently curved. *Pistil* straight, shorter than perianth; pollen presenter narrow, ribbed. *Old flowers* ?falling. *Follicles* woody, large, easily detached, usually opening when mature. *Seed* brown, elliptic with annular wing, attached each side at base to a wing of similar shape; separator absent.

Monotypic. The seed is very unusual and the floral bracts enlarge more than in any other species, but the flowers are similar to those of *Dryandra* ser. *Gymnocephalae*. Bipinnatifid leaves also occur in *D. preissii*.

Dryandra bipinnatifida R. Br., Suppl. Prodr. Fl. Nov. Holl. 39 (1830) - *Josephia bipinnatifida* (R. Br.) Kuntze, Revis. Gen. Pl. 2: 578 (1891). *Type*: Swan River, [Western Australia], March 1827, *C. Fraser* (*holo:* BM).

Distribution. Ranges from Eneabba and Mt Lesueur south to Busselton and Manjimup and inland to Chidlow and Dryandra.

Discussion. A distinctive species in its foliage, large flowers and fruit. Perianth almost succulent at base, the tepals broadened above, then very narrow, with a very long limb. The floral bracts enlarge greatly in fruiting heads.

There are two varieties based mainly on flower size and leaf form.

1 Perianth 48-57 mm long, with a few long apical hairs; involucral bracts 6-8 cm long; leaf lobes 1.2-3 mm wide; Perth southwards ..... subsp. **bipinnatifida**

1: Perianth 42-45 mm long, the apex glabrous or rarely 1 or 2 long hairs; involucral bracts 5-6 cm long; leaf lobes usually 0.6-0.8 mm wide; Eneabba to Muchea ..... subsp. **multifida**

Dryandra bipinnatifida R. Br. subsp. **bipinnatifida**

Leaf lamina usually 25-33 cm long; lobes 1.2–3 mm wide. *Involucral bracts* 6-8 cm long. *Perianth* 48-57 mm long; limb with a few long, apical hairs. *Floral bracts* elongating to 28-35 mm in fruit.

Distribution. Occurs on the Darling Plateau east of Perth and south to Manjimup.

Habitat. Grows in lateritic soil in Jarrah forest and woodland.

Flowering period. October-November.

Dryandra bipinnatifida R. Br. subsp. **multifida** A.S. George, subsp. nov.

Ab subsp. *bipinnatifida* lamina foliis plerumque 15-20 cm longa, lobis plerumque 0.7-0.8 mm latis; bracteis involucralibus 5-6 cm longis; perianthio 42-45 mm longo, limbo glabro pilis longis 1 vel 2 apicalibus; et bracteis floralibus in fructu ad 20-23 mm elongatis, differt.

Typus: 5 km S of Cataby, Brand Hwy, Western Australia, 30°46'S, 115°34'E, 11 October 1983, *A.S. George* 16276 *& P. Nikulinsky* (*holo:* PERTH 04228928; *iso:* CANB, NSW).

Leaf lamina usually 15-20 cm long, lobes usually 0.7-0.8 mm wide. *Involucral bracts* 5-6 cm long. *Perianth* 42-45 mm long; limb glabrous or with 1 or 2 long, apical hairs. *Floral bracts* elongating to 20-23 mm in fruit.

Selected collections examined. Cockleshell Gully, *C.A. Gardner* 8428 (PERTH); N of Mt Benia, NE of Mt Lesueur, *E.A. Griffin* 2415 (PERTH); Marchagee Track, E of Dewar Rd, *E.A. Griffin* 3474 (PERTH).

Distribution. Occurs between Eneabba and Muchea.

Habitat. Grows in sand over laterite in kwongan.

Flowering period. October-November.

Conservation status. Dept of Conservation & Land Management Conservation Code: Priority Four.

Etymology. Epithet from the Latin *multus* (many) and *-fidus* (-divided), in reference to the finely divided leaves.

Discussion. Although one or two collections are intermediate, these subspecies are usually easily recognized on the basis of their leaf division.

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Index

New names and combinations in **bold** roman, other accepted names in light roman, and synonyms in *italics*.